THE AMERICAN YEAR BOOK

RECORD OF THE YEAR

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THE AMERICAN YEAR BOOK

A Record of Events and Progress

YEAR 1930

EDITOR

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PREFACE

The present-day advance in science, engineering, economics, matters of government and of international relations, is so rapid and so deeply significant in the intimate life of every man, woman and child, it is not only important but imperative, alike practically and culturally, to keep informed of major developments in the world and in the nation in particular. Hence the purpose of THE AMERICAN YEAR BOOK is to provide from year to year a succinct record of achievements in the life of the United States in the broadest meaning of the term.

In these fast-moving times, to embody the progress of one year within the compass of a single volume of reasonable size, it has been necessary to exercise careful selection in the choice of matter and with equal care to present the matter so selected to the best possible advantage by way of clarity, utility and relative proportion. The contributing organization of The American Year Book has been developed on the manifestly sound principle that only a mind possessed of the most thorough grasp of a subject can project it at once comprehensively and briefly. Within this organization each article has been prepared by one or more individuals affiliated with a national society or institution recognized as of the highest position in its field. In addition, there has been organized a Supervisory Board composed of representatives of forty-seven learned societies which supervises the publication of the Year Book.

The better to facilitate the obligation of the Year Book to provide channels leading to the fullest information on subjects treated in the various reviews, each major division of the book has been supplemented with a list of cognate societies to which the reader may apply for more extended information and for reference to specialized publications.

For obvious reasons American achievements are primarily considered, but events and developments abroad are reviewed when essential to a better understanding of what is taking place in this country. This observation is particularly applicable to a survey of fields that transcend international boundaries, *e.g.*, the sciences, engineering and certain aspects of economic and political relations.

The Association of The American Year Book with *The New York Times* and with its publisher, Mr. Adolph S. Ochs, whose great public spirit is so widely acknowledged, may be regarded as evidence of the desire of the Year Book to meet the requirements of the reading public.

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THE
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A RECORD OF EVENTS AND PROGRESS

PART ONE
HISTORICAL

DIVISION I

AMERICAN POLITICAL HISTORY

CONGRESS AND ITS FUNCTIONS

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SESSIONS OF THE SEVENTY-FIRST CONGRESS

Reconvening Jan. 6, the second or regular long session lasted until July 3. A special session of the Senate July 7-21 was exclusively concerned with the ratification of the treaty for the limitation of naval armaments concluded at London April 22. The third or short session opened Dec. 1, disbanding for the holiday recess Dec. 20. Even before the long session began, business stagnation and unemployment had become pronounced. While the session lasted, however, neither the President nor the House leaders were disposed to emphasize the crisis, perhaps hoping for an early upward turn; and, although deeply affected, the work of Congress in the spring was inhibited by the seeming failure to recognize or admit the extent of the need. Subsequently to the adjournment of the long session, however, bright prophesies proved false, drought conspired with depression in the countryside, and the trend of the fall elections, though they fell short of a revolution in the control of Congress, was a warning of the mood of the electorate. When Congress met in December, it was fully in the shadow of the economic emergency. It was evident that the major strategy of the session would center in the wish of the administration, seemingly concurred in by the more conservative leaders on both sides, to avoid a special session of the 72nd Congress.

PARTY GROUPS

Membership.—At the time the second session adjourned, the House comprised 261 Republicans, 164 Democrats, and 1 Farmer Labor member, with nine seats vacant. The replacements incidental to the elections brought these groups at the beginning of the third session to 266, 165 and 1, respectively, with 3 vacancies. In the Senate, the changes effected between sessions resulted in a slightly more pronounced shift; 53 Republicans, instead of 56; 42 Democrats, instead of 39; and a single Farmer Labor member, as before. The outlook for the 72nd Congress, according to the clerk's forecast in December (with certain seats in dispute, and one vacancy), indicated that in the House 218 members would be Republicans, 215 Democrats, and 1 Farmer Labor, and in the Senate, 48 would be Republicans, 47 Democrats, and 1 Farmer Labor.

Pennsylvania Senatorship. — Once more the place of the junior senator from Pennsylvania attracted attention. James J. Davis, late Secretary of Labor, having unhorsed Joseph R. Grundy (senator by gubernatorial appointment) in the Republican primary and having triumphed in the election, was seated Dec. 2, over the protest of Sen. Nye, chairman of the special committee investigating campaign expenditures. The resolution which proposed that, in view of the large outlay alleged to have been made in behalf of Mr. Davis his right to a seat should be referred to the special committee, was rejected by a vote of 27 (9 R., 17 D., 1 F. L.) to 58 (39 R., 19 D.).

Organization.—The organs of control, having been instituted either in the special session or at the beginning of the long session, were only slightly changed during the year. At a conference of Republican senators Jan. 10, Charles L. McNary, Oregon, was formally invested with the rank of assistant leader, in place of Sen. Wesley L. Jones of Washington, now chairman of the Appropriations Committee. At the same time, the conference ratified the solution which the Committee on Committees had at last arranged in a troublesome wrangle over committee appointments, whereby Sen. LaFollette of Wisconsin was preferred to Sen. Goff of West Virginia in filling one of the vacancies on the Finance Committee, the other going to Sen. Thomas of Idaho. Tardily, on April 8, Sen. Watson, the Republican leader, announced the appointment of the steering committee (the Committee on Order of Business of the Republican Conference), consisting of Goff, chairman; Hastings, Delaware; Kean, New Jersey; Vandenberg, Michigan, and Frazier, North Dakota. The belated nature of this action was perhaps an appropriate recognition of the relatively passive rôle of this ostensible instrumentality of Senatorial direction.

THE TARIFF

In the Senate.—Congress had enmeshed itself in the toils of tariff-making early in the special session, before business, hopeful if hungry, had begun to share in agriculture's winter of discontent. Having passed the House May 28, 1929, the Tariff Bill (H. R. 2667) was still the main concern of the Senate at the beginning of the new year and was destined, though attended by diminishing enthusiasm, to consume no small part of the energy of Congress until nearly the close of the second session.

In the checquered course of its consideration during this period, the outstanding development was the weakening of the lines of the so-called coalition after March 3, when the bill was reported from the committee of the whole to the Senate, proper, with reservations which involved the reopening of many controversies. The explanation of the shift in the Senate's center of gravity at this stage seemed to lie in the fact that the coalition represented in large part an implicit alliance of extractive industries seeking to secure more favorable treatment in relation to finished products. In such a situation, the failure of any important raw material to obtain the aid of the others in advancing itself was likely, in addition to creating a spreading feeling of resentment, to cause its representatives to give ear to reciprocal proposals which the industrial spokesmen were not slow in making. Much of this was a tenuous sort of bargaining implicit in the circumstances, but after March 4 the recriminations were increasingly bitter, and many of the complaints regarding trading were pointed and convincing.

The indirect results of this development perhaps affected the rates on manufactured products as much as those on raw materials but the most signal votes involved the reversal of the Senate's stand on sugar, cement, and lumber, and the narrow failure to secure a reversal on oil. On Jan. 16, after six days of debate, an amendment to strike out the proposed increase of the duty on sugar carried by 48 (18 R., 29 D., 1 F. L.) to 38 (34 R., 4 D.), but on March 5, increased sugar duties were adopted by a vote of 47 (38 R., 9 D.) to 39 (13 R., 26 D.). Cement was restored to the free list Jan. 31, by a vote of 40 (15 R., 24 D., 1 F. L.) to 35 (29 R., 6 D.). March 7, however, a duty on cement was approved by 45 (26 R., 19 D.) to 37 (13 R., 24 D.). On lumber the attempt Feb. 27 to secure a duty failed by a vote of 24 (15 R., 9 D.) to 39 (19 R., 20 D.), but March 20 a duty on soft woods was approved by 39 (27 R., 12 D.) to 38 (21 R., 17 D.). Oil was refused a duty Feb. 28, when it was favored by only 27 (20 R., 7 D.) and opposed by 39 (17 R., 22 D.). In the Senate proper, an amendment proposing such a duty barely lost by a vote of 37 (28 R., 9 D.) to 38 (17 R., 21 D.). It may be remarked that an echo of these reversals was heard May 16, when the Senate, by a vote of 48 to 13, amended its rules to provide for the abolition of the stage of the "committee of the whole" in the consideration of legislative matters.

The effect on the tariff of the trend between March 4 and 24 is indicated in the fact (according to Sen. LaFollette) that whereas the bill, as it passed the House, embodied 845 increases and 82 decreases in the rates of the 1922 act, and whereas these had been transformed into 620 increases and 202 decreases by the time the measure had been reported by the committee of the whole of the Senate March 3, during the final period in the Senate, 75 increases were approved, involving imports amounting to $355,000,000 and only 31 decreases, involving commodities with imports worth $34,000,000. Even so, taking the *ad valorem* rates as a whole, the level of the bill passed by the Senate was to that of the House draft as 38.99 to 43.15. In all, 1,253 amendments were made. The vote by which the Senate approved the bill March 24 was 53 (46 R., 7 D.) to 31 (5 R., 26 D.). The Democrats who voted for it were Broussard and Ransdell (La.), Trammell (Fla.), Bratton (N. M.), Kendrick (Wyo.), Copeland (N. Y.), and Pittman (Nev.). The five Republicans who voted against it were Blaine and LaFollette (Wis.), McMaster and Norbeck (S. D.), and Norris (Neb.).

The Tariff in Conference.—On May 1 a partial conference report which covered the rate schedules was adopted in the House by a vote of 240 (232 R., 18 D.) to 151 (16 R., 134 D., 1 F. L.). Separate roll-calls were allowed on sugar and cement, regarding both of which the somewhat lower Senate rates prevailed, and on lumber and silver, on both of which, however, the duties proposed by the Senate were rejected in favor of restoring these materials to the free list. The troublesome differences over the flexible tariff and export debentures had not yet been adjusted in conference. The House voted on these points May 3. It refused to approve the Senate's proposal to withdraw the President's flexible tariff powers, the vote being 154 (12 R., 141 D., 1 F. L.) to 236 (228 R., 8 D.), and it declined to accept the farm debentures rider by 161 (48 R., 112 D., 1 F. L.) to 231 (194 R., 37 D.). May 7, the Senate returned the bill to conference. Surrender to the House, however, was facilitated by the action of the Senate May 19, when the conferees were freed from their virtual pledge to stand firm on the flexible tariff and the debentures amendments. On the flexible tariff, it was necessary for the Vice-President to break a tie, 42 to 42; on debentures, surrender carried by a margin nearly as narrow—43 (37 R., 6 D.) to 41 (12 R., 28 D., 1 F. L.).

The final conference report was adopted in both chambers June 13. In the House it was supported by 222 (208 R., 14 D.) and opposed by 153 (20 R., 132 D., 1 F. L.). Of the Republicans who voted nay, 7 were from Wisconsin, 4 from Minnesota, 2 from South Dakota, 2 from New York City, and one each from Iowa, Missouri, Oklahoma, Kentucky, and California. In the Senate the division was 44 (39 R., 5 D.) to 42 (11 R., 30 D., 1 F. L.). The Republican members who joined most of the Democrats in the final vote on the tariff were LaFollette and Blaine (Wis.), McMaster and Norbeck (S. D.), Norris and Howell (Neb.), Frazier (N. D.)—Nye being paired against the bill, Schall (Minn.), Brookhart (Iowa), Pine (Okla.), and Borah (Idaho).

DEPRESSION AND DROUGHT

Action and Inaction in the Second Session.—The caution of the House leaders was explicable enough, though in retrospect some find it less excusable than it seemed at the time. The attitude in question was illustrated by the history of three bills, all of which passed the Senate, but only one of which became law during the year. The successful measure (S. 3061, passed by the Senate April 28 and by the House July 7, approved July 7) was of minor though not negligible importance; it merely directed the Bureau of Labor Statistics to collect more adequate monthly unemployment statistics and in itself it carried no appropriation for the purpose. A second bill (S. 3060) proposed to universalize and strengthen a system of public employment exchanges by giving Federal aid to the states. It was delayed in the Senate by the professed opposition of the National Manufacturers' Association but May 12, in the face of an attack led by Sen. Bingham, Connecticut, it was passed by a vote of 34 (12 R., 21 D., 1 F. L.) to 27 (23 R., 4 D.). In the House it was reported June 26, but was not brought to a vote. Still another measure (S. 3059) sought to provide for advance planning of public works, to be developed as buffer employment in emergencies, and to this end it proposed to institute an *ex officio* Federal employment stabilization board, to introduce more flexibility in certain existing legislation respecting public works, and to authorize an emergency appropriation of $150,000,000 in any one year. The Senate passed it April 28. In the House it was referred to the committee on the judiciary (to the admitted annoyance of members of the labor committee), amended in vital respects, and passed July 1, only to rest in conference. Sen. Wagner, New York, who introduced the bill, attributed the instigation of the amendments to the White House. "The President," he said, "could not have more completely destroyed the bill if he had vetoed it." The animus of this remark may have been partisan, but the fact remained that the President, developing administrative relationships which tended to be personal or extra-legal, did not press effectively for action by Congress.

It is true, of course, that Congress made provision for enlarged public construction along three lines: notably, extended Federal aid for roads; the authorization of further appropriations for public buildings in accordance with the program which has been shaping since 1926; and in the enactment of the first omnibus rivers and harbors act passed in several years. It may be noted that, despite these and minor provisions for construction and development, the total amount of the regular annual, the deficiency, and the miscellaneous appropriation acts passed in the second session was $25,115,353 less than the budget estimates. The appropriations (exclusive of those for the postal service, payable from postal revenues) exceeded those of the previous fiscal year by $209,018,194. This increase, however, was attributable rather to new legislation in behalf of veterans of various wars than to the augmenting of public construction. This fact, in itself, characterizes the program of the long session.

Unemployment Relief in the Third Session.—The tone of the short session was more exigent. In the opening weeks, measures of relief obscured other issues. In his regular message Dec. 2, the Persident recommended "an appropriation of from $100,000,000 to $150,000,000 to provide . . . . further employment in this emergency" and two days later, in transmitting an estimate for the larger sum, he wrote that "the test of the value of such relief is the ability to pay wages between now and the end of the fiscal year." In the face of this, on Dec. 9, the House passed a bill (H. R. 14804) which carried $110,000,000, allocated to major purposes by the measure itself, but with a proviso for reassignment at the discretion of the President. In the Senate, the total amount was raised to $118,000,000, but on Sen. Robinson's motion the proviso regarding the President was eliminated. This action aggravated the friction that arose from the resolution adopted by the Senate Dec. 3, requesting the President to transmit a report of his emergency commission on unemployment. In his reply Dec. 16, the President declined to do so, saying that such informal reports as had been tendered "represent that confidential relation of the President with Government officers which should be preserved." In a statement issued Dec. 9, the President had spoken of "playing politics at the expense of human misery." The executive displeasure was understood to be directed less at the House than at the Senate. The rejoinders in that body were bitter. In the view of some, the President's declaration that "prosperity cannot be restored by raids upon the public treasury," though unexceptionable in itself, meant in effect that the Administration program would again be cautious rather than courageous. It was evident that the rift in public policy was profound. So far as the immediate issue of the construction bill was concerned, the Senate gave way. On Dec. 18 it receded from the amendment by which it had sought to deny the President power to reallocate the emergency funds; the vote was 42 (34 R., 8 D.) to 39 (11 R., 27 D., 1 F. L.). The measure became law Dec. 20.

Agricultural relief, meanwhile, brought the Houses into further conflict. On Dec. 9 the Senate passed a joint resolution (S. J. Res. 211) which proposed to authorize an appropriation of $60,000,000 for loans to farmers in the drought and storm-stricken areas in connection with preparations for the 1931 crop. The Administration indicated that less money would be sufficient, and it disapproved the provision for emergency aid in the form of food. The leaders of the House decided to cut the amount to $30,000,000. On Dec. 15, in the hope of staving off amendments from the floor, the altered resolution was brought up under a motion to suspend the rules. The necessary two-thirds vote was lacking, however, the division being 205 (204 R., 1 D.) to 159 (16 R., 142 D., 1 F. L.). Slightly altered, including a vague reference to "other purposes of crop production" which would broaden the discretion of the Secretary of Agriculture, the resolution was accepted Dec. 18, the vote on the committee amendments being 225 (219 R., 6 D.) to 147 (16 R., 130 D., 1 F. L.). In conference, the authorized appropriation was raised to $45,000,000; it was argued, moreover, that the revised reference to "such other purposes incident to crop production as may be prescribed by the Secretary of Agriculture" might conceivably cover help in obtaining food for human consumption. Thus compromised, the resolution was signed by the President Dec. 20, although the actual appropriation of the loan fund was left till after the holiday recess. As for additional appropriations to the revolving fund of the Federal Farm Board, the President's request Dec. 8 for $150,000,000 was granted without much direct controversy, although there was incidental discussion of the Board's policy (H. R. 15359, passed without record votes, approved Dec. 22).

Inter-Party Coöperation.—In a statement issued Nov. 7, a group of Democratic leaders—the three living former candidates for the Presidency, the two floor leaders, and two officers of the national committee—solemnly took note of the trend of the elections, of their new responsibility, of the national emergency, and of the need of collaboration. In wiring his thanks, the President revealed a trace of uncertainty; he hoped it implied a pledge not to filibuster against the appropriation bills in the crowded short session. The same anxiety prompted Presidential telegrams Nov. 12 to the floor leaders on both sides, and on the basis of the replies a statement was issued from the White House the following day, saying "the fears and apprehension which have been expressed over reports that delay or filibuster would be resorted to to force an extra session of the Congress have therefore no foundation." On Nov. 30, similar optimism attended an announcement that something like an agreement had been reached in conversation with Sen. Robinson, the Democratic leader. Despite this, ambiguity and uncertainty persisted, and the first weeks of the session deepened them, although amid the wrangling, emollient reassurances were renewed from both sides. It was not clear that spokesmen like Sen. Robinson truly represented his group or could commit or control them. On the other hand, it seemed that the President would be aided by the reluctance of the Democratic members as a whole to emphasize working relations with the Progressive Republicans. But there were signs that this tendency might be temporary. The Progressive faction, meanwhile, was active and hardly likely to be rendered less aggressive by the revelation before the Special Committee on Campaign Expenditures in December of the covert attack on Sen. Norris in the primary by Robert H. Lucas, an officer of the Republican National Committee, which led Mr. Lucas—dropping his disguises—to refer to the Senator as "a growing cancer in the vitals of the Republican Party" and Rep. Wood, chairman of the Appropriations Committee and the Republican Congressional Committee to say (when interviewed on leaving the White House Dec. 23), "the time has come for a showdown. . . . If there is to be a Republican Party, there must be Republicans in it." The Progressive element tended to endorse the idea of a special session, but up to the close of the year they had formulated no threats. It seemed likely that their tactics would depend largely upon the treatment given to certain items among the more important measures still in suspense.

PENDING MEASURES

Muscle Shoals.—The interest in water power seemingly manifested in the fall election made the question of the national policy toward Muscle Shoals more of a touchstone than ever. On April 4, the Senate again approved the plan offered by Sen. Norris (S. J. Res. 49) for public operation of the properties. The vote was 45 (18 R., 26 D., 1 F. L.) to 23 (21 R., 2 D.). The joint resolution was rewritten by the House committee, however, which substituted the proposal of Rep. Reece (defeated for reëlection in November) that a 50-year lease should be negotiated by a Presidentially appointed commission. The House adopted this May 28 by a vote of 197 (156 R., 41 D.) to 114 (35 R., 78 D., 1 F. L.). At the time the *impasse* in conference seemed insoluble, but the conferees were busy in December, with the House managers perhaps inclined toward concessions because it appeared that the next Congress would be even more favorably disposed to Government operation. The stumbling block seemed to be the reluctance of the leaders to concede governmental transmission to certain main distributing points as well as generation of power.

Injunctions.—Another touchstone of progressive policy was the bill (S. 2479) to restrict the use of injunctions by Federal courts in labor disputes, which had been painstakingly redrafted under the auspices of a subcommittee of the Senate Committee of the Judiciary. A bare majority of that committee opposed it, however, and June 9 it was reported unfavorably, accompanied by a favorable minority report signed by seven members.

"Lame-duck Amendment."—A third likely touchstone was the proposed constitutional amendment (S. J. Res. 3, associated with the name of Senator Norris) for a change in the scheme of Congressional sessions, including an advance in the date of the Presidential inaugurations. The Senate passed it for the fifth time June 7, 1929, by 64 (36 R., 28 D.) to 9 (7 R., 2 D.). It was not until April

17, 1930, that the Speaker referred it to a House committee. Meanwhile, on April 8, a somewhat similar resolution (H. J. Res. 292) was reported by that committee. In the short session, there were intimations that the House organization might allow some such proposal to come to a vote, but in view of their well-known hostility to changes likely to increase the opportunities of legislation and to curtail the President's discretion regarding short sessions, it was doubtful whether they would agree to eliminate short sessions in alternate years.

The Carriers.—The Parker Bill (H. R. 10288) for the regulation of motor busses, after several years of negotiation and revision, passed the House on March 24 by a vote of 219 (178 R., 41 D.) to 115 (30 R., 84 D., 1 F. L.). It was reported to the Senate April 14, was temporarily displaced as unfinished business June 25 by a vote of 30 (12 R., 18 D.) to 27 (19 R., 7 D., 1 F. L.), but was the unfinished business at the opening of the short session. On Dec. 4, however, it was recommitted by a vote of 51 (25 R., 26 D.) to 29 (20 R., 8 D., 1 F. L.), with little likelihood of being revived during the session. On Dec. 4, however, it was recommitted by a vote of 51 (25 R., 26 D.) to 29 (20 R., 8 D., 1 F. L.), with little likelihood of being revived during the session. Sen. Couzens charged that the railroads, having failed to dislodge certain prohibitions against unification in it, had changed front and were lobbying against it. So far as concerns railroad consolidation, the nearest Congress came to action during the year was the passage by the Senate May 21, by 46 (23 R., 22 D., 1 F. L.) to 27 (20 R., 7 D.), of a resolution (S. J. Res. 161) proposing to suspend the existing authority of the Interstate Commerce Commission to approve consolidations. This evidenced an attitude which, in view of the proposals that emanated from the eastern roads in December, might lead to a reopening of the question in Congress.

Maternity Aid.—Dec. 8, the measure for the renewal of the scheme of Federal subsidies for maternity aid (S. 255, reported on April 9) became the unfinished business of the Senate. The repulse of Sen. Bingham's motion to recommit it, defeated Dec. 17 by a vote of 14 to 74, and a unanimous consent agreement for the restricting of debate reached the following day, assured its passage at least by the upper house.

Immigration.—In the course of the long session, a proposal to apply the quota system to Mexico (S. 51) was passed in the Senate May 13 by 51 (24 R., 27 D.) to 16 (13 R., 2 D., 1 F. L.), after attempts to saddle it with various extraneous amendments, such as the repeal of the national origins provision, had failed. It was reported in the House May 13 but did not move further. In the short session, the President renewed his still vague references to "need for revision of our immigration laws upon a more limited and more selective basis, flexible to the needs of the country." The avowals of Sen. Reed and others made it clear that, amid much confusion of counsel, a drive would be made for the temporary, qualified suspension of European immigration.

Miscellaneous.—Among the measures featured by House leaders as liable to move in the short session were the Capper-Kelly resale practices bill (H. R. 11, reported Jan. 27), and the Vestal copyright revision bill (H. R. 12549, originally reported May 28, twice recommitted, and reported last June 24). Bearing on the program of the commission on law observance and enforcement, several brief measures had made some progress. One of these (H. R. 9985), dealing with penalties under the prohibition act and seeking to state a more precise basis for distinguishing casual and habitual or commercial violations, went to conference July 2. A bill for the waiving of jury trial in criminal cases (H. R. 12056) passed the House and was reported in the Senate. The proposal to empower summary action before U. S. commissioners (H. R. 9934) was approved by the House June 4 by a vote of 218 (161 R., 56 D., 1 F. L.) to

117 (44 R., 73 D.), but did not move in the Senate.

VETOES

In the course of the long session, four measures were returned with veto messages, and in addition three were extinguished by the pocket veto. In the case of the bill to increase pensions of Spanish-American War veterans, the veto was over-ridden June 2 by a vote of 61 (28 R., 32 D., 1 F. L.) to 18 (all R.) in the Senate, and 298 (184 R., 114 D.) to 14 (all R.) in the House. In the case of the other vetoed veterans' bill (H. R. 10381) involving the service men of the World War, the attempt to repass it failed in the House by 182 (45 R., 136 D., 1 F. L.) to 188 (185 R., 3 D.), after arrangements had been made in a Republican conference to pass a substitute bill. The other two messaged vetoes, like the three pocket vetoes, concerned minor legislation.

INVESTIGATIONS

Presidential.—In connection with three matters of note, Congress gave the President money for investigations, leaving him free to determine the means: conditions and policies in Haiti (H. J. Res. 170, approved Feb. 6); the conservation and development of the public domain (H. R. 6153, approved April 10); and the "problem of the enforcement of the prohibition laws of the United States, together with the enforcement of other laws," for which an additional $250,000 was given, together with the reappropriation of the unexpended balance of the commission on law observance.

Joint Committees.—Provision was made for a joint body, consisting of members partly from Congress and partly from the Cabinet, to consider the possibility of amending the Constitution "to provide that private property may be taken for public use during war and methods of equalizing the burdens and to remove the profits of war" (H. J. Res. 251, approved June 27). A joint committee was directed to study the matter of readjusting the pay of the commissioned and enlisted personnel (S. J. Res. 7, approved Feb. 3).

Senate Committees.—Four fresh investigations were put in the hands of special committees. These concerned campaign expenditures, post office leases, the conservation of wild life, and the Alaska Railroad. Four inquiries already being conducted by standing committees were renewed, and four new subjects were added. Not including requests for information from the Tariff Commission, the Senate adopted 17 resolutions asking data from various executive officers during the second session, and five others in the short session. During the spring, the chief focus of interest was the sub-committee of the Senate Committee on the Judiciary investigating lobbying pursuant to S. Res. 20, passed in the special session; but June 13 its chairman, Sen. Caraway, indicated that no further witnesses would be called. The stage was then taken by Sen. Nye's inquest regarding the use of money in the senatorial primaries and elections of 1930.

In the House.—Unwonted provision was made for two investigations by special committees, concerning communist activities and campaign expenditures. Studies of holding company control of railroads and of group, chain and branch banking were to be made under the auspices of the committees on commerce and banking, respectively.

APPOINTMENTS

Supreme Court.—The willingness of the Senate to consider the social philosophy of nominees to the court is significant and may well prove a wholesome warning. When Charles Evans Hughes was nominated as Chief Justice, following the death of Chief Justice Taft, enough opposition developed to bring on four days of discussion. Supporters of the Administration forced a vote Feb. 13, when Mr. Hughes was confirmed by 52 (38 R., 14 D.) to 26 (11 R., 15 D.). John J. Parker of North Carolina, judge of the Circuit Court of Appeals, nominated for the place vacated by the death of Justice Sanford, was vulnerable on the mingled grounds of lack of clear preëminence in the law, his attitude as a politician toward negro suffrage, and his record in a labor case. After over a week of debate, the Senate rejected his name May 7 by a vote of 39 (29 R., 10 D.) to 41 (17 R., 23 D., 1 F. L.). May 20 the appointment of Owen J. Roberts was confirmed.

Power Commission.—The short session brought before the Senate the President's nominations to the reorganized Federal Power Commission. Hearings were held by the Commerce Committee and the nominees were interrogated. On Dec. 19, R. B. Williamson (Wash.) and C. L. Draper (Wyo.) were confirmed. On the following day, F. R. McNinch (N. C.) was confirmed by a vote of 42 to 11, M. Garsaud (La.), 42 to 14, and George Otis Smith, nominated as chairman, 38 to 22. With a policy seemingly at stake, it did not seem likely that this was the end.

TREATIES

The Naval Treaty and the Special Session.—Delay in the consideration of the treaty for the limitation of naval armaments, signed in London April 1, appeared likely to work to its disadvantage. On May 23, the President let it be known that if the treaty was not acted upon in the regular session he would immediately reconvene the Senate in special session for the purpose. The session met July 7. The only difficulty arose in connection with the Senate's attempt, both while the treaty was in committee and afterwards, to secure certain antecedent and attendant papers, popularly dubbed the secret documents. The Administration stubbornly refused, insisting, on the one hand, (in the language of the Secretary of State) that the question of ratification must "be determined from the language of the document itself, and not from extraneous matter," and, on the other (in the President's words), that "there is not one scintilla of agreement or obligation of any character outside the treaty itself." A way out was found in Sen. Norris' reservation, unanimously adopted July 19, stating that the Senate ratified the treaty "with the distinct understanding that there are no secret files, documents, letters, understandings, or agreements which in any way, directly or indirectly, modify, change, add to or take away from any of the stipulations, agreements, or statements in said treaty." The treaty itself was ratified July 21 by a vote of 58 (40 R., 18 D.) to 9 (7 R., 2 D.).

World Court.—In a special message Dec. 10, the President transmitted certain documents concerning adherence of the United States to the Court of International Justice, declaring that "the provisions of the protocols free us from any entanglement in the diplomacy of other nations," and adding the hope that "the protocols may have consideration as soon as possible after the emergency relief and appropriation legislation has been disposed of." There soon developed a general feeling among the party leaders that the issue must not be allowed to cross the threshold of the Senate in the short session, lest it lead to a special session in the spring. On Dec. 17 the Committee on Foreign Affairs voted to postpone a report until the opening of the regular session in December, 1931. This decision was reached by a vote of 10 (9 R., 1 F. L.) to 9 (2 R., 7 D.). By this narrow margin did the committee serve the President's amended purpose.

SIGNIFICANT FEDERAL LEGISLATION

By Arthur W. Macmahon
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ADMINISTRATIVE ORGANIZATION

Power.—In place of the *ex officio* body provided by the Federal water power act of 1920, Public No. 412 (S. 3619, approved June 23, 1930) established a Federal Power Commission of five members, to be appointed for overlapping terms of five years by the President to give their full time to its work, and to be paid $10,000 annually. The Commission is authorized to constitute its own staff, although at its request officers may be detailed from other departments; apart from this, its powers are those conferred by the act of 1920.

Veterans.—Public No. 536 (H.R. 10630, approved July 3) authorizes the President to consolidate in a Veterans' Administration (headed by the Administrator of Veterans' Affairs, appointed by the President and paid $12,000 annually) all agencies concerned with relief or other benefits provided by law for former members of the military and naval establishments, including the former Bureau of pensions, Veterans Bureau, and National Home for disabled volunteer Soldiers.

Prohibition and Narcotics Control.—The prohibition reorganization act (Public No. 273, H.R. 8574, approved May 27) transfers the main task of enforcement to the Department of Justice, creating the Bureau of Prohibition headed by a director appointed by the Attorney General without regard to the civil service laws, receiving a salary of $9,000. Regulations regarding permits, however, are to be prescribed by the Attorney General and the Secretary of the Treasury jointly; and a remnant of the staff of the former prohibition bureau is continued in the Treasury Department under the title Bureau of Industrial Alcohol. Another act creates a new unit in the Treasury Department, known as the Bureau of Narcotics (headed by a commissioner appointed by the President with a salary of $9,000 upon which are devolved certain duties previously vested in the former Prohibition Bureau and the Federal Narcotics Control Board, which is abolished. The former narcotics division of the Public Health Service is to be known as the Division of Mental Hygiene, and provision is made for coöperation with the Bureau of Narcotics.

AGRICULTURE

Regulatory.—The self-styled "perishable agricultural commodities act" (Public No. 325, S. 108, approved June 10), in addition to stigmatizing certain practices in interstate or foreign commerce, provides for control through the licensing of commission merchants, dealers and brokers. Public No. 538 (H.R. 730, approved July 8) amends the food and drug act of 1906 in giving the Secretary of Agriculture express permission to determine the standards of canned goods. Public No. 540 (H.R. 6, approved July 10) changes the definition of oleomargerine in the act of 1886 and its amendments.

Promotional.—A so-called Foreign Agricultural Service is to be developed under Public No. 304 (H.R. 2152, approved June 5), into which is merged the personnel previously maintained abroad by the Bureau of Agricultural Economics. Public No. 245 (S. 4015, approved May 23) amends the conditions for the patenting of plants, in order to give plant developers the same protection as industrial inventors.

Relief.—For the purposes of the Porto Rican Hurricane Relief Commission, set up in 1928, the appropriation of an additional $3,000,000 is authorized by Public Resolution No. 33 (S.J.Res. 118, approved Jan. 22), partly for individual loans and partly for rebuilding schools and roads. In connection with the crop of 1930 in the storm- drought- or flood-stricken areas of 15 enumerated states, Public Resolution No. 47 (S.J.Res. 117, approved March 3) permitted the Secretary of Agriculture to make advances or loans to farmers, to be secured by a first lien and to be used for specified purposes. An appropriation of $7,000,000 was authorized. In view of the drought of 1930, in connection with the crop of 1931, Public Resolution No. 112 (S.J.Res. 211, approved Dec. 20) authorizes the appropriation of $45,000,000 for use in drought- storm- or hail-stricken areas, in assisting farmers to obtain seed, fertilizer, feed for work stock, fuel and oil for tractors, or aid for "other purposes incident to crop production."

Public No. 551 (H.R. 15359, approved Dec. 22) appropriates to the Federal Farm Board an additional $150,000,000 of the sum authorized as a revolving fund by the agricultural marketing act of 1929.

CIVIL SERVICE

Retirement.—Public No. 279 (S. 15, approved May 29) revises the act of 1920, as amended in 1926, at a number of points too numerous and complicated for summary here, beyond observing the tendency indicated by the committee's estimate that the cost of retirement under the new legislation will exceed that of the old system by about $16,000,000 annually.

Classification.—In addition to making changes in the salary rates of certain grades as specified by the act of 1923, last revised in 1928, Public No. 523 (S. 215, approved July 3) creates the new position of "director of classification", appointed by the Personnel Classification Board, which shall henceforth consist of the heads of the bureaus of budget and of efficiency and a member of the Civil Service Commission. Public No. 336 (S. 3054, approved June 11) increases the salary range of postmasters of the first class.

CONSTRUCTION

Roads.—Federal aid is liberalized by Public No. 90 (H. R. 5616, approved April 4), which authorized the appropriation of an additional $50,000,000 for the fiscal year ending June 30, 1931, and appropriations of $125,000,000 (instead of $75,000,000, as previously) for the two following years, and which raises the maximum national contribution under certain circumstances to $25,000 (instead of $15,000) per mile. Public No. 179 (H.R. 10379, approved May 5) enlarges the sums which can be appropriated for the building of forest roads and trails. In other acts, special provision is made to help three states in repairing damage to or destruction of roads and bridges by floods in 1929, imposing a public charge against the property of the state beyond its reasonable capacity to pay" (Alabama, $1,660,000, by Public No. 71, S. 2093, approved March 12; Georgia. $506,067, by Public No. 267, S. 3783, approved May 27; South Carolina, $805,561, by Public No. 292, S. 3189, approved June 2).

Buildings.—The construction program laid down in the act of 1926 and further developed by legislation in 1928 is broadened, without essential change in direction, by the authority given in Public No. 85 (H.R. 6120, approved March 31) to appropriate an additional $115,000,000 for public building projects outside the District of Columbia and an equal sum for use within the District. Quite apart from this, provision is made in specific acts for the enlargement of certain establishments: in connection with the Bureau of Standards, additional land (Public No. 414, H.R. 7997, approved June 23) and the construction of a national hydraulic laboratory (Public No. 219, H.R. 8299, approved May 14); the extension of the Natural History Building of the United States National Museum (Public No. 392, S. 3970, approved June 19); the modernization of the Naval Observatory (Public No. 343, H.R. 9370, approved June 11); and the construction of an annex to the Library of Congress, for which an appropriation of $6,500,000 is authorized (Public No. 354, H.R. 8372, approved June 13).

Waterways.—An omnibus rivers and harbors act (Public No. 520, H.R. 11781, approved July 3) authorizes new work involving a total estimated cost of $144,881,902. Among other things, it empowers the National Government to accept (without expense to it, and assuming that New York State agrees) the state-owned canals of New York and to operate them at an estimated annual cost of $2,500,000, but "as barge canals only, and not as, or with any intention to make them ship canals, or to hinder or delay the improvement of the St. Lawrence Waterway as the seaway from the Great Lakes to the ocean."

Emergency Appropriations. — In the third session, after sharp controversy regarding both total amount and method of allocation, Public No.

550 (H.R. 14804, approved Dec. 20) appropriated additional sums aggregating $116,000,000 "for the purpose of providing for emergency construction on certain public works during the remainder of the fiscal year 1931 with a view to increasing employment." The act assigns specified sums to roads, rivers and harbors, and flood control, subject, however, to the proviso that "the sums herein appropriated shall be available interchangeably for expenditure on the objects named in this act upon order of the President."

HEALTH

Provision for the general coördination of the public health activities of the government through the Public Health Service and for changes in its scheme of personnel are made by Public No. 106 (H.R. 8807, approved April 9), which (apart from amendments made to meet the presidential objections) is substantially the same as a bill vetoed in the 70th Congress. An interesting act (Public No. 251, S. 1171, approved May 26) establishes a National Institute of Health, to be developed from the hygenic laboratory of the Public Health Service, which, on the recommendation of a national advisory health council, may accept gifts for its use in study, investigation and research, in addition to the appropriation of $750,000 immediately authorized.

INTERSTATE COMPACTS

The Rio Grande Compact, signed at Santa Fé, Feb. 12, 1929, by representatives of Colorado, New Mexico and Texas and ratified by the legislatures of these states in the same year, is assented to by Congress (Public No. 370, S. 3386, approved June 17).

JUDICIAL

Petty Offenses.—One of several bills understood to be sponsored by the so-called Commission on Law Observance and Enforcement amends Sec. 335 of the criminal code by adding the proviso "that all offenses, the penalty for which does not exceed confinement in a common jail, without hard labor for six months, or a fine of not more than $500 or both, shall be deemed to be petty offenses; and all such petty offenses may be prosecuted upon information or complaint" (Public No. 548, H.R. 10341, passed in the House, June 3 by 181 to 48, without a record vote, and in the Senate, Dec. 3, without opposition, approved Dec. 16).

Organization.—Additional circuit judges are provided in the Third and Fifth Circuits (Public Nos. 327, 326), additional district judges in the Minnesota district, southern district of California, and southern district of Florida (Public Nos. 276, 447, 449), and two additional judges each for the Court of Appeals and the Supreme Court of the District of Columbia (Public Nos. 390, 391).

PENOLOGY

Organization.—A reorganization of the administration of Federal prisons by the Department of Justice is briefly outlined by Public No. 218 (H.R. 7832, approved May 14), which provides for a Bureau of Prisons headed by a director appointed by the Attorney General and paid $10,000 annually, and which also restates the conditions governing contracts with state and local authorities. Public No. 337 (H.R. 977, approved June 11), in providing for a Division of Identification and Information gives direct statutory recognition and encouragement to work already begun by the Department of Justice in acting as a clearing house for criminal identification records.

New Institutions.—In order (says the act) "to facilitate the development of an integrated Federal penal and correctional system which will assure proper classification and segregation of Federal prisoners," the Attorney General is authorized to select sites and submit estimates for two institutions, one which is to be in the west and of the reformatory type for the confinement of young offenders, and the other of which is to be in the northeastern section for the incarceration of adult male persons (Public No. 270, H.R. 6807, approved May 27). A separate act (Public No. 201, H.R. 7410, approved

May 13) authorizes similar steps towards the establishment of a hospital for defective delinquents.

Parole and Probation.—The powers of preëxisting boards of parole are transferred to a single Board of Parole of three members, appointed by the Attorney General and paid $7,500 annually (Public No. 202, H.R. 7413, approved May 13); and the probation system established by the act of 1925 is amended so that probation officers can be appointed in all districts in the country (Public No. 203, H.R. 9235, approved May 13).

Employment. — Public No. 271 (H.R. 7412, approved May 27) seeks to empower the Attorney General "to provide employment for all physically fit inmates in the United States penal and correctional institutions in such diversified forms as will reduce to a minimum competition with private industry or free labor."

TARIFF

The Tariff Act of 1930 (Public No. 361, H.R. 2667, approved June 17) involves changes in the rates on approximately one-third of the dutiable items in the tariff list, 890 of the 1,125 changes being increases, including 50 transfers from the free to the dutiable list; and 235 being decreases, including 75 transfers from the dutiable to the free list. In an official apology released by the President, June 15, it was said that, according to estimates by the Tariff Commission, "the average rate upon agricultural raw materials shows an increase from 38.10 per cent to 48.92 per cent, in contrast to dutiable articles of strictly other than agricultural origin, which show an average increase of from 31.02 per cent to 34.31 per cent." On the administrative side, a number of changes are made, which, as a whole, tend to enlarge the discretionary power of the Treasury Department. As regards so-called flexibility, the conditions are restated, but the President's powers are in general unchanged, for the Senate failed in conference to carry its proposal for withdrawal. On the other hand, the President and House lost in their attempt to secure a tariff commission which would be an essentially Presidential agency, provision being made, as before, for a bipartisan body of six members, with the stipulation that it be constituted afresh after the passage of the act.

VETERANS

World War.—Numerous, relatively important amendments to the World War Veterans' Act of 1924 are made by Public No. 522 (H.R. 13174, approved July 3, which passed in place of H.R. 10381, vetoed by the President, June 26), the most noteworthy change being the authorization, in Sec. 200, of disability allowances in the case "of 25 per centum of more permanent disability," even though "not acquired in the service during the World War, or for which compensation is not payable."

Spanish-American War, etc.—In behalf of approximately 114,000 veterans of the war with Spain, the Phillipine insurrection, or the China relief expedition, pension rates are increased by upwards of 20 per cent and the minimum length of service necessary is reduced from 90 to 70 days, at an additional cost estimated at $12,000,000 annually (Public No. 299, S. 476, vetoed May 28, but repassed in both houses June 2).

Civil War.—Public No. 323 (H.R. 12013, approved June 9), at a cost estimated to be upwards of $13,000,000, increases the pensions of Civil War survivors and their widows.

THE PRESIDENT AND HIS POLICIES

By James Hart

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THE HOOVER HANDICAPS

Economic Factors.—An estimate of the second year of the Hoover Administration will include consideration of the President's handicaps, his relations with Congress, his strength and weakness as a politician and statesman, and his major achievements. No fair account can neglect the factors beyond the control of Mr. Hoover which handicapped his efforts and caused his prestige to wane. The year was one of business depression and unemployment. This situation was aggravated by an unprecedented summer drought over wide areas, and resulting crop failures. Continued over-production and bad business conditions caused the first year of the Hoover Farm Board to witness a fall in the price of wheat to pre-war levels, despite the Board's heavy buying of wheat on the market. An unseemly and protracted tariff scramble furnished material for criticism at home and abroad. Despite the presidential desire for limited tariff revision, Congress enacted the Hawley-Smoot bill, which carried a "general" revision upwards. The Democratic-Insurgent Coalition in the Senate dragged out the tariff debate, only to fall to pieces and allow special interests to have their way.

Political Factors.—A nominally Republican Senate was consistently hostile to the President, and sought out occasions to rebuff him, a factor which would have been more serious but for the Administration's control of the House through the effective leadership of Speaker Longworth. On the tariff and the Spanish War veterans' bill even this leadership failed the chief. The Watson floor leadership in the Senate did not or could not adequately support the Administration. The effectiveness with which Mr. Michelson ran Jovett Shouse's Democratic publicity bureau for spreading anti-Administration propaganda was far from being matched on the Republican side. That acute observer. Frank Kent, has stressed the importance of this factor. Franco-Italian naval rivalry nearly wrecked the London Naval Conference, and kept the President from realizing his dream of "actual" naval reduction, by which he had hoped to promote international good will and relieve the American taxpayer. Early in the year the Wickersham Commission made preliminary proposals on prohibition enforcement; but the delay necesarily involved in the Hoover method as applied to that problem—the method of careful survey by experts—laid the President open to partisan criticism. So new is this method in politics that old-timers at the game often dismiss Mr. Hoover, in the words of one of them, as a "very good blue print man."

The 1930 Elections.—Nineteen hundred and thirty was election year, and several of these unfavorable factors—depression, drought, unemployment, continued farm troubles, the tariff, Senate criticism, Democratic propaganda, and the newness of the Hoover idea—may have contributed to Democratic gains. There were, of course, other factors: the return of Southern constituencies to the Democratic fold, the prohibition issue, and the normal off-year election swing toward the Opposition. The Democrats came out of the campaign with revived hopes for 1932 and an opportunity to claim that Hoover leadership had been "repudiated." The 72nd Congress will have practically a tie in both houses. The Administration will scarcely be able to play the regular House against the irregular Senate, as in the 71st Congress. To the short session of the latter the President had to announce the prospect of a large deficit for the current fiscal year; and hence he had to ask discontinuance of the one per cent income tax reduction which he had secured as a relief measure in December, 1929.

THE PRESIDENT AND CONGRESS

In the Regular Session.—The special session adjourned Nov. 22, 1929, without having carried out the President's tariff policy. In the regular session beginning in December, 1929, Congress readily voted the money for the Haiti Commission. But in February the anti-Hoover Senators registered 26 votes against the confirmation of Charles Evans Hughes as Chief Justice; and later the Senate flatly rejected the nomination of Judge John J. Parker to the Supreme Court—an unusual step—only to approve a little later, and without discussion, the name of Owen J. Roberts, a man ranked as a conservative. April 4 the Senate adopted by 45 to 23 the Norris plan for a governmentally operated power plant at Muscle Shoals, despite the President's known disapproval of government operation. Neither house heeded the President's twice-repeated plea for limited tariff revision, but both joined to enact a more general revision. The Senate voted for debentures and against the President's flexible clause, only, however, to yield in the end on both to Hoover-House solidarity. On June 2 both houses overrode the President's veto of the Spanish War veterans' pension bill. The House on June 26 sustained the veto of a World War veterans' bill by which both houses had originally passed the buck to the President. On June 27 the Senate voted $50,000 for the Wickersham commission instead of the $250,000 requested by Mr. Hoover, and sought to limit the inquiry to prohibition alone. But in the end it again yielded to Hoover-House solidarity. The help of the House also enabled the President to get more nearly what he wanted in the substitute World War veterans' bill.

In the Special and Short Sessions.—In its special session in July the Senate gave its consent to the London naval treaty with a harmless reservation. In December, 1930, in the short session, the Senate doubled the amount recommended for drought relief, bitter words passing between the President and senators. But the conference committee effected a compromise by splitting the difference, and allowing $45,000,000. This measure and additional emergency appropriations for the Farm Board and construction work were passed and signed by Mr. Hoover before the Christmas recess.

Summary.—This summary is not meant to indicate that the President was always right and the Senate always wrong. Mr. Hughes was a most distinguished lawyer and statesman; but Senate criticism may have been a wholesome warning to a too conservative Court; Judge Parker was hardly the best available choice. Many believe the President's doctrinaire attitude on Muscle Shoals to be "reactionary." The purpose here is to indicate the three-cornered relations between President, Senate, and House. Mr. Hoover got his main treaty through the Senate; and won in several legislative tilts with that body through loyal party support in the House. On the other hand, the Senate rejected a Supreme Court nomination, while the House completely failed the chief in two major instances.

THE PRESIDENT AND POLITICS

Party Chairmanship.—A successful President must control his party. Mr. Hoover made an inept choice of a national chairman. Even after Mr. Huston had been "discredited" before the country, he stuck to his post tenaciously. The President was pictured as "weak" for not vigorously calling his "bluff." Observers also said that it should have been anticipated that Senator Fess would be more of a liability than an asset as Mr. Huston's successor. Certainly neither could equal the Raskob-Shouse-Michelson combination of the Democrats.

Party Leadership and the Tariff.—It was not to be expected that the President would veto the Hawley-Smoot bill; this would have prolonged the already too long tariff discussions. Critics held, however, that a strong assertion of leadership at a much earlier date might have brought the House in line. At any rate, they said, the President should have braved the political risk involved. They hold that he suffers from an exaggerated sense of the dangers of strong leadership. In defense of the President, it is pointed out that the Democratic-Insurgent Coalition might have given him what he wanted, had it not delayed the bill only to crumble to pieces. One interpretation would hold that he "realized" his inability to dramatize his leadership in the way Roosevelt and Wilson knew so well how to do. This sounds like an admission of weakness. But it must be remembered that even Roosevelt did not tackle the job of reforming the Republican Party in the matter of the tariff.

London Naval Treaty.—Critics allege that it was this same "timidity" which kept Mr. Hoover from agreeing to a consultative pact even when the London Naval Conference seemed about to go on the rocks without it. The reply is that he may have sincerely disbelieved in such a pact. The critics counter by affirming that his habit of leaning upon experts in matters of engineering leads him also to lean upon "expert" advice in matters of political expediency. They add that experts in politics are either "timid" or else they seek, like Borah in the matter of the consultative pact, to inspire "timidity" by threats.

Instances of Presidential Firmness.—Friends of the President can, however, point to firm stands which he has taken. He stood firmly against the export debenture plan, and firmly for a flexible tariff clause to be administered by a reorganized Tariff Commission. He promptly called a special session of the Senate in July in order to push through the London Naval Treaty before demagogues had time to arouse popular prejudices that would endanger ratification. He showed reasonableness mixed with firmness in refusing, on the ground of incompatability with the public interest, certain documents requested by the Senate during its debate on the naval treaty. He vetoed two "raids on the Treasury" in the form of pension bills, though one was passed over his veto. Incidentally, he gave "message vetoes" of two other measures of minor importance, and "pocket vetoes" of three minor bills. He took his courage in his hands in April to advocate American adherence to the World Court before the Daughters of the American Revolution; and sent the protocols for American adherence to the court to the short session of the Senate in December. He invited a clash with the Senate during the early stage of the short session, when he denounced proposed relief plans whose advocates, he said, were playing politics at the expense of human misery. Shortly before that he had called the "bluff" of William Green by appointing as Secretary of Labor a man not affiliated with the American Federation of Labor.

Criticism.—Critics again reply that an expert like Thomas Walker Page considers the flexible tariff unwise, and that Mr. Hoover demanded it as a "way out" in his failure to get the sort of tariff he wanted. They point out that firmness against the debenture plan, pension "raids", and "radical" relief measures, means keeping a firm hold on the loyalty of conservative business. They ask where that firmness was on the vital question of general tariff revision.

THE PRESIDENT'S ACHIEVEMENTS

Adminstrative Reform. — Despite his handicaps and his critics, Mr. Hoover had solid accomplishments to his credit by the end of 1930. His legislative program for administrative reforms resulted, in the second session of the 71st Congress, in such important enactment as: the creation of a consolidated Veterans' Administration; the transfer of the major task of prohibition enforcement from the Treasury Department to the Department of Justice; the creation of a Bureau of Narcotics in the Treasury Department in place of the old *ex officio* Federal Narcotics Control Board; the reorganization of the Tariff and Power Commissions; the creation of a Bureau of Prisons under a director in the Department of Justice; and the creation of a single, full-time Board of Parole in place of several institutional boards. He secured further farm aid through the Perishable Agricultural Commodities Act, and the establishment of a Foreign Agricultural Service in the Department of Agriculture. In July the President had the satisfaction of signing a bill which inaugurated his fifteen-year program of waterway development. Other beneficial legislation of a "sociological" character bears on its face the stamp of the Hoover influence.

Appointments.—The President may be criticised for various appointments; such as, the retention of Brossard on the Tariff Commission, the naming of a man of no more distinction than Parker for the Supreme Court, and the selection of relatively unknown men to the important Federal Power Commission. Certain of his choices for the lower Federal courts have also been seriously attacked. On the other hand many of his selections have been of a high order. All Presidents make happy and unhappy appointments. Mr. Hoover's choices probably include more that are clearly commendable than do most Presidents'. Only a few examples can be given. J. Reuben Clark, Jr., was no doubt an able successor to Morrow as representative to Mexico. The President promoted Mr. Hurley to be Secretary of War when Secretary Good died. He sent able men to the London Conference and to Haiti. He made an outstanding man Chief Justice. He made the sensible Mr. Woodcock Prohibition Director. He placed men like Fletcher and Page on the reorganized Tariff Commission, and Col. Arthur Woods in charge of the unemployment problem.

Economic Accomplishment.—The President has been energetic in his efforts to help the farmer, stimulate business revival, relieve unemployment, and overcome the effects of the summer drought. In August he cancelled his Western vacation trip in order to organize drought relief. He called a conference of several governors, Red Cross leaders, and the Farm Board; and plans for loans, reduced rail rates, and Red Cross aid were soon under way. He organized a national drought committee headed by Secretary of Agriculture Hyde. He ordered acceleration of authorized waterway and river projects. In October he selected an *ex officio* board on unemployment, which secured Col. Arthur Woods to form a national organization. When Congress met in December, he secured from it large appropriations to accelerate construction on public works, for productive loans to farmers, and for additional funds for the Federal Farm Board. It is here that his organizing genius shines to better advantage than do his moves in practical politics. No other President has met business depression with such energetic efforts to organize state and local self-help or with plans for such vast expenditures on construction work and for drought relief loans. But if the Wagner unemployment bills or loans for farmers' "food" seem to Mr. Hoover to be "radical," then the issue is one on which no expert's knowledge—not even Mr. Hoover's—gives a conclusive answer. For the issue involves a clash both of ends and of tentative hypotheses upon which no economist can be dogmatic.

Foreign Relations.—In the field of foreign relations Mr. Hoover has two outstanding achievements to his credit for 1930. He met the Haitian crisis by the selection of an able commission which, after hearings, got Haitian leaders to agree to a compromise among themselves, and thus led the way for gradual relaxation of our present control. And his was a major role in checking, through the London naval treaty, naval competition between England, Japan, and America. It was not the President's fault if he could not carry out his broader purpose of "actual" reduction.

THE HOOVER IDEA

It is already evident that the expert in politics is no animated panacea. But every great President contributes to the tradition of his office some great idea which outlives his failures and his specific achievements. The Hoover idea is presidential initiative in organizing community cooperation, in inaugurating expert surveys of social and economic problems, and in planning governmental aid or relief that does not infringe upon "individualism." Besides the illustrations given above, the White House Conference on Child Health and Protection may be cited. It is pertinent to remark that the ideal President needs also to evolve regulatory policies out of the findings of experts, and to have a *flair* for popular leadership to win support for his regulatory proposals. This requires both a larger insight than the expert is apt to have, and a courage equal to the energy of the organizer.

It is here that the Hoover idea needs to be supplemented by the Wilson idea combined with the Al Smith idea. But with all its limitations, the Hoover idea is pregnant with possibilities. Every statesman who is remembered by later generations becomes in tradition not what he really was, but an over-capitalization of his great idea. It may be predicted that the present President will go into the pages of our future histories as an over-capitalization of this "Hoover idea."

FEDERAL ADMINISTRATIVE COMMISSIONS

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FEDERAL FARM BOARD

Coöperative Marketing.—The Federal Farm Board, in administering the agricultural marketing act of June 16, 1929, has had as its first major objective the promotion and development of coöperative marketing associations, owned and controlled by producers. It has encouraged local associations to form regional and national organizations wherever conditions in the industry permitted. The Farmers National Grain Corporation, the first national organization sponsored by the Board, was incorporated Oct. 29, 1929. The National Wool Marketing Corporation was incorporated in December, 1929, and during 1930 the Board assisted in the formation of similar agencies for cotton, beans, livestock, pecans, and sugar beets. Under authority of Section 3 of its organic act the Board has invited, and coöperative associations have appointed, advisory commodity committees for dairy products, wool and mohair, wheat, cotton, coarse grains, livestock, and sugar beets and sugar cane. These committees have been especially valuable in advising the board relative to loans and emergency stabilization measures.

Surplus Control and Stabilization.—The second major objective of the Farm Board is the prevention and control of commodity surpluses in order to eliminate undue and excessive fluctuations in prices. In furthering this objective the Board has: first, waged a vigorous campaign to secure curtailed production; second, has engaged in extensive stabilization measures for wheat and cotton. As an initial step in its emergency stabilization program, the Board advanced funds to the national associations for the purchase of wheat and cotton at fixed prices from member coöperatives only, but opposition from commission merchants, particularly in the case of wheat, and continually falling prices forced the Board to resort to stabilization corporations to which loans were made for the purchase of these commodities at market prices. Assurances were given to bankers, merchants, and growers that the large stocks of wheat and cotton thus acquired would not be marketed at the expense of further price declines.

Loans.—The agricultural marketing act authorized a revolving fund of $500,000,000 to be used by the Board in making loans to coöperative associations, $150,000,000 of this amount being made available immediately, and an additional $100,000,000 was voted by Congress on April 11. Initially the Board made direct loans to individual coöperatives, but subsequently advances were made only through regional or national associations. During the first year of its operations the Board made advances of $191,811,522 and its net commitments totalled $242,659,476. Increased demand for loans, particularly in connection with wheat and cotton stabilization, led the President to request an additional appropriation of $150,000,000 for the revolving fund which was voted by Congress as an emergency relief masure in an act approved Dec. 22.

Future Problems.—The Farm

Board faces a critical test of the efficiency of its program during the coming year. Demoralization in the world grain markets in December forced the Grain Stabilization Corporation to enter the market a second time. The apparent success of this measure in establishing a domestic price of wheat approximately 20 cents above world price levels, and in preventing a panic in the grain trade, with serious consequences to the nation's entire financial structure, elicited the praise of even the severest critics of the Board. However, business in general still questions the economic soundness of its program, prices for farm products are considerably below the levels obtaining when it began operations, and the stabilization corporations have accumulated formidable stocks of wheat and cotton which appear far beyond the ability of domestic and foreign markets to assimilate. The ultimate outcome seems to depend very largely upon the success of the campaign for reduced acreage.

FEDERAL POWER COMMISSION

Reorganization.—An amendment to the Federal Water Power Act was approved June 23, 1930, providing for the appointment of five full-time commissioners to replace the Secretaries of War, Agriculture, and Interior. It had been apparent for some time that the growing responsibilities of this Commission could not be discharged promptly and efficiently by officers engaged in the performance of other important duties, but Congress was reluctant to take action resulting in the establishment of another permanent regulatory agency.

Personnel.—President Hoover announced July 1 the appointment of Gen. Edgar Jadwin, retired chief of the Army Engineer Corps, as chairman of the new commission, but the appointment was declined. The President delayed sending any nominations to the Senate until that body neared a vote on the London naval treaty, and perhaps he would have made no effort to do so had he not been advised informally by the Attorney General that the language of the amendment cast some doubt upon his power to give recess appointments to the commissioners. The names of Claude L. Draper of Wyoming, Ralph B. Williamson of Washington State and Marcel Garsaud of Louisiana, were submitted to the Senate July 19 and were favorably reported by the Interstate Commerce Committee before adjournment July 21, but an objection prevented action upon them. On Aug. 25 the White House announced that appointment of members of the Commission would be deferred until the next session of Congress. On Dec. 3, President Hoover nominated George Otis Smith, director of the U. S. Geological Survey, chairman, and Frank R. McNinch of North Carolina in addition to the three previously named. All were reported favorably and confirmed by the Senate Dec. 21, though not without opposition.

Internal Dissension.—Sharp differences of opinion between the executive secretary, F. G. Bonner, and the solicitor, C. A. Russell, and the chief accountant, W. V. King, relative to the use of accountants in other departments to facilitate the examination of investment cost statements, and the necessity for "meticulous" care in the scrutiny of promotion and construction costs of licensed power projects, were brought to light during the year by Congressional investigations. The departmental secretaries delayed putting an end to this internal squabble until the new commissioners were appointed. The first official act of the new commission was the dismissal of Messrs. Bonner, Russell, and King Dec. 23, Chairman Smith stating that "the commission didn't want to investigate affairs of the old commissioners, but wanted to start out with a new crew." Supporters of Russell and King in the Senate promise to prolong the controversy by seeking a reconsideration of the votes confirming members of the commission.

Jurisdiction.—The Attorney General, in an opinon dated Sept. 22, held that in the issuance of licenses for power projects on non-navigable streams the Commission is not required by the Federal Water Power Act to insert any conditions, other than the 50-year limitation, which, in its judgment, are not necessary nor appropriate to protect the navigability of the river into which the stream flows. Although the Commission has issued very few licenses in such cases, it has received numerous protests from states which anticipate an attempt to interfere in the field of state regulation. The solicitor has advised the Commission that the law permits the same jurisdiction on projects of this sort as on projects on navigable streams, and this view has been supported by various members of Congress. The Commission deferred action on an application of the Appalachian Electric Power Co. for a minor part license for a power project on New River in Virginia, evidently deciding to bequeath the problem to the new Commission.

FEDERAL RADIO COMMISSION

Permanent Establishment.—By an act approved Dec. 18, 1929, the Federal Radio Commission was established as a permanent agency. The terms of all five members expired Feb. 23, and President Hoover avoided what promised to be a spirited controversy over the policies of the Commission by reappointing all of the commissioners, and they were confirmed promptly by the Senate with little opposition. On June 25 the Commission for the first time adopted a definite code of practice and procedure governing the conduct of hearings before it, and made provision for the appointment of examiners in the legal division to conduct hearings in all but exceptional cases. A separate examiners division was created Dec. 19.

Equalization and High Power.—To assist in its enforcement of the Davis amendment, the Commission ordered June 17 the adoption of a "unit" system of evaluating power, frequencies, and operating time in the several zones and states. The general allocation of Nov. 11, 1928 continues to be the basic plan for the distribution of frequencies. One major shift was ordered, effective April 30, 1930, which changed the assignments of 26 stations operating on cleared channels. This reallocation was postponed indefinitely, however, after three of the stations involved secured restraining orders from Federal courts in the District of Columbia. Taking cognizance of the growing demand of stations for maximum power on cleared channels, the Commission issued an order June 16 setting aside 20 of the 40 cleared channels, previously authorized, for stations operating with 50,000 watts power. The chief examiner, in a report made to the Commission Dec. 15 relative to applications for maximum power, recommended that the order of June 16 be modified and that such licenses be granted to 20 of the 24 stations seeking them. The Commission declined to consider the advisability of changing its previous order, and directed the chief examiner to submit a new report recommending which of the 20 stations should be given the eight remaining assignments. More or less drastic proposals for effecting a more equitable and satisfactory distribution of broadcast privileges have been presented in recent months by members of the Commission, but all these proposals were rejected by the Commission Dec. 15. Rapid progress in the perfection of synchronization, which is evidenced by the granting of permits to four important eastern stations on Dec. 16 to engage in synchronized operation on a practical basis, may prove to be the way out of this confusing muddle.

Litigation.—The Supreme Court on Jan. 20 abruptly terminated the Commission's appeal from a decision of the District Appellate Court sustaining the petition of station WGY in opposition to the reallocation order of 1928 by deciding that the action of the Court of Appeals in reviewing orders of the Commission is administrative rather than judicial and therefore not subject to review by the Supreme Court. This decision, and the growing number of appeals being taken from orders of the Commission, hastened action by Congress to remedy the situation. An act was approved July 1 which provides that review of the decisions of the Commission by the Court of Appeals shall be limited to questions of law and that findings of fact, if supported by substantial evidence, shall be conclusive unless clearly arbitrary or capricious, and that the decisions of the Appellate Court shall be subject to review by the U. S. Supreme Court upon writ of certiorari.

FEDERAL RESERVE BOARD

Personnel.—Roy A. Young, governor of the Federal Reserve Board for three years, resigned Sept. 1, 1930. Announcement was made Sept. 5 of the appointment of Eugene Meyer, Jr., of New York, former director of the War Finance Corporation and Farm Loan Commissioner, to succeed Mr. Young, and of the resignation of Edmund Platt, also of New York, as vice-governor of the board. Inasmuch as the Federal Reserve Act provides that no two members of the board shall be appointed from the same reserve banking district, Mr. Platt's resignation came at a most opportune time. Edward H. Cunningham of Iowa, member of the Board representing agriculture, died Nov. 28. Mr. Meyer's name was submitted to the Senate for confirmation Dec. 2, and was favorably reported by the Finance Committee Dec. 10, with only two dissenting votes, but no final action was taken before adjournment Dec. 20.

Credit Policies.—The stock market debacle in October, 1929, was followed by a rapid liquidation of bank credit and the adoption of an easing credit policy by the Federal Reserve System. Successive lowering of the rediscount rate was employed in 1930 to improve business conditions. After several reductions, the New York bank reached the record low figure of 2½ per cent on June 19, and by the middle of September all the other banks had reduced their rates to 3½ per cent or lower. In spite of this reduction in rates to record low levels, the total rediscounts of member banks with the Federal Reserve System declined from $768,922,000 on Dec. 11, 1929, to $257,097,000 one year later.

FEDERAL TRADE COMMISSION

Investigations.—Two of the several investigations ordered by Senate resolutions were completed by the Commission and final reports prepared in 1930. On June 30 the Commission reported to the Senate that "no evidence was found of any practices of domestic manufacturers and distributors of newsprint paper showing unlawful discrimination against the publishers of small daily and weekly newspapers, or that constitute violations of the anti-trust laws." On Dec. 19 the Commission submitted its final report on interstate and international transmission of electric power, which showed that in 1929 the gross ratio of power transmitted across state lines to quantities generated was 15.18 per cent, and the gross ratio of quantities imported to quantities consumed was 19.64 per cent. This information reaches Congress at an opportune time because of the numerous proposals looking toward some form of Federal control of power transmission. The Commission, in its eighteenth interim report on the power and gas utilities inquiry, indicated the completion of its investigation into the propaganda phase of utility corporation activities. No findings of fact were included in the report. Public hearings on the financial phase of the inquiry were begun Feb. 24 and were continued from time to time throughout the year.

Court Decisions.—An order of the Commission issued in May, 1923, directing the International Shoe Co. of St. Louis to divest itself of the stock of the W. H. McElwain Shoe Co. of Boston, which purchase was held substantially to decrease competition in violation of Section 7 of the Clayton Act, was invalidated by the Supreme Court on the ground that the trade of the two companies was in different territory and reached a different class of dealers, although both manufacturers produced articles comparable in price and quality and adapted to the same need. Justices Stone, Holmes, and Brandeis, dissented, holding the Commission's findings to be based on substantial evidence and therefore entitled to judicial support. In the case of the Raladam Company the Circuit Court of Appeals for the Sixth Circuit held June 28, 1930, that the Commission was exceeding its jurisdiction in issuing cease and desist orders in cases where it concludes that sales methods may mislead a substantial part of the purchasing public, when such practices have no relation to questions of monopoly or restraint of trade. The Commission applied to the Supreme Court for a writ of certiorari, which was granted Nov. 3. The review of the case is to be limited to the question of jurisdiction.

INTERSTATE COMMERCE COMMISSION

Personnel.—The two vacancies in the membership at the beginning of the year were filled by the appointment of William E. Lee, Chief Justice of the Idaho Supreme Court, and H. M. Tate, attorney and former chancellor, of Tennessee. The resignation of Thomas F. Woodlock, and the appointment of Charles Mahaffie, finance director of the Commission, to succeed him were announced by the President Aug. 1. Mr. Mahaffie, who was confirmed by the Senate Dec. 16, brings to the Commission intimate acquaintance with the financial problems involved in railroad construction and consolidation, and his appointment serves as a valuable precedent in view of his long period of service with the Commission. The nomination of Mr. McManamy for another term awaited Senate confirmation at the close of the year.

Railroad Consolidation.—In keeping with its plan for railroad unification announced Dec. 21, 1929, the Commission granted approval Feb. 21 to the proposed Great Northern-Northern Pacific merger, subject to the exclusion of the Chicago, Burlington and Quincy, now owned jointly by the other two roads. Opposition to this merger and an inclination to await the results of an investigation of rail holding companies voted by the House Jan. 24, led to the passage by the Senate May 21 of a joint resolution which suspended the Commission's authority to approve consolidation except in conformity with certain specified requirements, and made illegal any railroad consolidation effected subsequent to Feb. 28, 1920, which restrains or lessens competition and which, prior to the passage of this resolution, had not been approved by the Commission. A House Committee amendment permitting acquisition of roads by holding companies if approved by the Commission, was not satisfactory to opponents of the Great Northern merger, and the resolution was shelved. No steps were taken to complete this consolidation pending final action on the resolution, and upon request of eight Northwestern States the Commission reopened the case Oct. 17. Among other consolidations approved by the Commission during the year, the acquisition of the Hocking Valley by the Chesapeake & Ohio, and the purchase of the Buffalo, Rochester & Pittsburgh and the Susquehanna by the Baltomore & Ohio were of special interest. Further efforts looking toward the consummation of the four-party plan for eastern trunk lines were undertaken at the suggestion of President Hoover, and after several months of negotiations, announcement was made Dec. 30 that an agreement had been reached.

Rate Cases.—Public service commissions in thirty-six states joined with North Dakota in a petition to the Supreme Court to set aside an injunction issued by a Federal District Court restraining the Board of Railroad Commissions of that state from putting into effect reductions in class rates for intrastate transportation until such rates had been approved by the Interstate Commerce Commission. Chief Justice Hughes, in an opinion delivered May 19 without dissent, held that intrastate rates are lawful until the Commission determines they are discriminatory, and that a Federal Court prior to such determination has no right to interfere with their enforcement. In the case of Ann Arbor Railroad *v.* United States, the Supreme Court ruled that the Commission, in lowering rates on deciduous fruits from California to

Eastern points, had erroneously based its order entirely upon the terms of the Hoch-Smith resolution, and had incorrectly assumed that this resolution changed the substantive provisions of existing laws relating to rates.

Clayton Act Violations. — The Commission on Dec. 6 charged the Pennsylvania Railroad and its subsidiary, the Pennsylvania Company, with violation of the Clayton antitrust act and ordered them to dispose of their stock holdings in the Wabash and Lehigh Valley Railroads. The order prohibits the transfer of this stock, purchased at high prices, to their holding company, the Pennroad Corporation. Respondents announced intention to contest the order in the courts. A similar order was issued Jan. 16 directing the Baltimore & Ohio to sell its stock in the Western Maryland. This order was not contested, but two extensions of time have been requested and granted by the Commission.

THE TARIFF COMMISSION

Personnel. — The President was given not to exceed 90 days in which to select the members of the new commission created by the Tariff Act of 1930. This proved to be a difficult task, and no attempt was made to submit nominees to the Senate before the adjournment of Congress July 21. The appointment of Henry P. Fletcher of Pennsylvania, former ambassador to Italy, as chairman, was announced Aug. 22. Then followed the appointment of Thomas Walker Page of Virginia, a former member of the Commission, as vice-chairman; Edgar B. Brossard, Utah, and Alfred P. Dennis, Maryland, members of the existing Commission, and John L. Coulter, North Dakota, chief economist of the old Commission. Fletcher, Brossard, and Coulter are Republicans and the other two are Democrats. Though not required to do so, the President evidently endeavored to secure representation for the various geographical sections of the country. Lincoln Dixon, Indiana Democrat, a member of the old Commission, was appointed as the sixth commissioner Sept. 26. These appointees were submitted to the Senate for confirmation Dec. 2, but the vote on Brossard was close, due to criticism of his record on the old Commission, and particularly his participation in a minority report on a proposed reduction in the sugar duty in 1923. The Senate deferred final action on these nominees until after the holiday adjournment.

Procedure.—Prior to its adjournment July 21, Congress directed cost of production investigations of 84 commodities or classes of commodities. When the dates of the first public hearings on these investigations were announced Oct. 8, the Commission also had received 90 private applications for rate adjustments. Under the new rules of procedure adopted by the Commission, hearings are to be public and will precede rather than follow investigations conducted by the Commission's staff. Applications will be considered by sub-committees of the Commission, which will direct the inquiry until its conclusion if investigation is ordered. That the Commission will attach considerable importance to the international aspects of the tariff problem is indicated by the appointment of Leland Harrison, former Assistant Secretary of State and Minister to Sweden and Uruguay, as chief of its International Relations Division, and of John F. Bethune, Former Secretary of the Commission, as resident foreign officer with headquarters in Brussels.

UNITED STATES SHIPPING BOARD

Ocean Mail Contracts.—Legislation recommended by the Shipping Board, but opposed by the Postmaster General, which would permit the award of ocean mail contracts to purchasers of government lines without competitive bidding failed to reach a vote in the Senate after having passed the House. Congress did pass a joint resolution June 21, however, which authorized the award of a mail contract for the Gulf-Brazil-River Plate route to the Mississippi Shipping Co., the purchaser of the line from the Shipping Board, disregarding the fact that this company was not the lowest bidder. The Board also favored bills introduced in both Houses which, if passed, would have prohibited the award of ocean mail contracts to American companies operating foreign-flag ships in competition with American-flag ships. In keeping with this proposed legislation, the Board announced Oct. 16 the adoption of a policy of refusing to sell ships to lines operating in competition with operators of government lines or holders of mail contracts. Charges that the Board was intentionally excluding competitive bids for mail contracts by certifying such requirements to the Postmaster General for trade routes as to give unfair advantage to purchasers of government lines, led to the passage of a Senate resolution April 22 calling for an investigation of Board policies and operation, but a motion to reconsider was adopted June 25 after Senator Copeland threatened a filibuster, insisting the resolultion was introduced to hamper the Government's merchant marine program.

Sale of Government Lines.—Differences among members of the Shipping Board relative to the sale of two transatlantic lines,—the American-Diamond and the American-France Lines,—led President Hoover to appoint an investigating committee of 5 members which began July 11 its consideration of this question and other problems related to the sales procedure of the Board. Following consideration of the report of this committee, the Board announced Dec. 11 the rejection of all previous bids for these lines and on the following day reported their sale to the operating companies whose original bids were lower than those submitted by the United States Lines. During 1930, the Merchant Fleet Corporation extended its lump-sum operating plan, first adopted in 1929, to several other companies operating government lines. This plan, together with the sale of all but 8 of the 40 lines in operation since the war, has so lightened the work of the Fleet Corporation that an order was issued Sept. 24 reorganizing its field and staff officers with an anticipated reduction in personnel of approximately 50 per cent. This reorganization was deferred by order of the Shipping Board Oct. 24 because of the unemployment situation.

THE SUPREME COURT AND CONSTITUTIONAL LAW

By Howard Lee McBain
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EFFECTS OF THE JURISDICTIONAL ACT OF 1925

It was not so long back when it was relatively easy to follow the main current of the development of American constitutional law in any one year by reading the opinions that were handed down by the Supreme Court during the so-called October term which runs from October to June. Since the speeding-up process inaugurated under the leadership of the late Chief Justice Taft this has become increasingly difficult. The Jurisdictional Act of Feb. 13, 1925, accounts for the difference. It has certainly speeded up the work of the Court. It has done this by shutting off from detailed and prolonged consideration by the highest court of the land of large numbers of cases that formerly came up almost as a matter of course. The thought underlying this Act is that justice to specific litigants is usually sufficiently meted when they have had an appeal to the highest court of the state or, if the case is in the Federal courts, to the United States Circuit Court of Appeals. Decisions by the Supreme Court should therefore be confined to cases involving conflicts among lower courts or questions that may be of general importance for the future. But in order thus to limit the scope of its labors as an opinion-writing group the Court has to undertake the enormous task of sifting the petitions that crowd upon it for hearing. That the number of such petitions is so large is undoubtedly due in part to the ignorance of the bar, or to the difficulty lawyers find in adjusting themselves to the new procedure or to a desire for one reason or another to prolong the process of litigation. This desire is a long standing item in the indictment against the administration of justice in the United States.

In this sifting process, however, the Supreme Court commonly gives no reasons whatever for allowing about one in seven of the applications that are made to it for review and for denying the other six. In consequence, the student of constitutional law must go back to the decisions of the lower appellate courts, state or Federal, to find out what has probably been decided by the denial of this or that petition for review. In many cases the reason is obvious to any fairly competent student. In some cases it is not. The most complicated factor is that the Court insists that when it refuses a petition it does not pass upon the merits of the controversy involved. In some instances it seems tolerably clear that there is nothing else it could have passed upon. Even so by such assertions it keeps its skirts clear of entangling alliances with the decisions of lower courts. But the net results are certainly somewhat bewildering.

INTERSTATE COMMERCE

Agricultural Freight Rates. — While Congress in 1930, was struggling with new measures for farm relief the famous Hoch-Smith Resolution of 1925, which was also a farm relief measure, came before the Supreme Court for consideration in the case of Ann Arbor R. Co. *vs.* United States, 281 U. S. 658. This was a badly drafted measure requiring among other vague things that the Interstate Commerce Commission should effect "such lawful changes in the rate structure of the country" as will permit the movement of agricultural products "at the lowest possible lawful rates compatible with the maintenance of adequate transportation service." The Commission took this admonition seriously. It reduced rates on deciduous fruits from the west to the east. But the Supreme Court effectually emasculated the Resolution by reversing the judgment of the district court which sustained this order. The words of the Resolution, said the Court, "were more in the nature of a hopeful characterization of an object deemed desirable . . . than a rule intended to control rate making." If they were more than merely hopeful they were of doubtful constitutionality. Hence they should be "held to work no substantial change in the existing law."

Intra-State Rates. — Since the Shreveport Case, 234 U.S. 342, Federal control over intra-state transportation has made further and further encroachments upon the powers of the states. In Railroad Commissioners *vs.* Great Northern R. Co., 281 U.S. 412, the Supreme Court called a halt. The enforcement of intra-state rates fixed by the North Dakota Railroad Commissioners, it said, could not be enjoined even temporarily unless and until the Interstate Commerce Commission had determined that their effect was to create an unjust discrimination against interstate commerce. Thus was an important remnant of power salvaged for state utility commissions.

Los Angeles Union Station Case. —By the decision handed down in Interstate Commerce Commission *vs.* United States, 280 U.S. 52, the City of Los Angeles lost a long-fought battle to compel the railroads entering that city to join in the erection of a union station. The Supreme Court held that Congress had not conferred upon the Commission the power to exert such compulsion but merely the power to issue certificates of necessity when the railroads themselves desire to establish a combined terminal. It was not intimated that Congress could not grant such power to the Commission but the Court was at pains to point out the enormous economic consequences that would be involved.

PUBLIC UTILITY CONTROL BY THE STATES

Los Angeles Traction Fares.—Over the protests of Justices Brandeis, Holmes and Stone, the Court sustained a decision of the U. S. District Court of California, enjoining the State Railroad Commission from interfering with a new street railway fare established by the Los Angeles Railway Corporation. Railroad Commission *vs.* Los Angeles Railroad Corporation, 280 U.S. 145. In many of its franchises the Company had agreed to charge a five-cent fare. But the Supreme Court held, after a most inadequate analysis of the complicated laws involved: first, that the city did not have the power to contract with the Company, and, second that even if it had this power its contracts with the Company had been abrogated by the state Railroad Commission merely because the latter had entertained an application for increased fare and had refused to authorize it. It is curious how the alleged "interests of the public" can so often be made to serve the interests of utility corporations. For here the absence of a valid binding contract in respect of the fare, which made an increased fare possible, was predicated upon the high policy that "it is in the public interest that all doubts be resolved in favor of the right of the state from time to time to prescribe rates." In this case, however, the net result was that the State's effort to prescribe rates was nullified.

Rate Contract In Georgia.—On the other hand in a Georgia case, the Court held that a rate contract between a traction company and a city was binding and that the company could neither discontinue operation nor increase the fare. "The contract will continue to bind the petitioner during the period intended by the parties, unless earlier altered by them or relaxed by state authority. The losses attributable to the stretch of track in question and the five-cent fare are immaterial while the rate contract continues." Georgia Power Company *vs.* Decatur, 281 U.S. 505.

Rate-Making Valuation. — In United R. and E. Company *vs.* West, 280 U.S. 234, the Court of Appeals of Maryland had held that in computing the valuation of a utility for rate-making, depreciation must be allowed on the basis of present value. This view the Supreme Court sustained, saying that "it is a settled rule of this Court that the rate base is present value, and it would be wholly illogical to adopt a different rule for depreciation." To this accusation of illogic Justice Brandeis in his dissent retorted that to adopt present value and reject original cost as the basis of depreciation "is a perversion of this business device." The problem, he declared, is one "to be solved not by legal reasoning but by the exercise of practical judgment based on facts and business experience." In this case the Court also held that a return of 6.26 per cent on valuation was confiscatory. As usual, the Court refused to fix a figure of fair return. That varies with time and circumstance. But certainly anything less than the 7.44 per cent which the Company sought would, in the Court's opinion, result in depriving the Company of property without due process of law.

EQUAL PROTECTION AND THE LAWS

In 1929 the Supreme Court held void a law of Oklahoma which favored coöperative cotton gins by requiring non-coöperative gins to show public convenience and necessity before they could obtain a license to operate. Frost *vs.* Corporation Commission, 278 U.S. 515. Such a law, said the Court, was a denial of equal protection. Thereupon a privately owned gin brought suit to enjoin the Corporation Commission from issuing a license to a coöperative gin on the ground that since the coöperative gin could distribute surplus income to patrons this amounted to a rebate and in consequence was a denial of equal protection to the non-coöperatives. The Court held, however, that this was not strictly a rebate and that privately owned gins could also legally distribute surplus profits to their patrons if they chose to do so. Corporation Commission *vs.* Lowe, 281 U.S. 431. The Court did not discuss the essential difference between the two classes of gins arising from the fact that the stockholders and the patrons of coöperatives are largely one and the same while the stockholders of privately owned gins are seldom patrons. Private corporations would rarely, if ever, have anything to gain by distributing surplus income to their customers. But to the stockholder in a coöperative who is also a customer it makes little difference whether he receives his share in the form of a dividend or of a distribution to customers. This is an excellent example of a highly questionable decision that makes necessary a subsequent decision that is even more questionable.

The constitution of Ohio provides that "no law shall be held unconstitutional and void by the Supreme Court without the concurrence of at least all but one of the judges, except in the affirmance of a judgment of the court of appeals declaring a law unconstitutional and void." The Supreme Court consists of seven judges. In Ohio *vs.* Akron Metropolitan Park District, five judges held that the particular statute in question was void while two held it to be valid. The decision of the Court of Appeals below was in favor of the statute. Hence the law was sustained by the vote of only two members of the highest court. This provision of the Ohio constitution was attacked on several grounds. But the principle point considered by the Supreme Court of the United States was the allegation that it denied the equal protection of the laws. Since there are a number of courts of appeals in Ohio it is obvious that if one of them sustained a law and another held the same law invalid the strange situation would prevail that the law would be both valid and invalid. The United States Supreme Court held in effect that it was not its business to correct the absurd situation created by this provision of the Ohio constitution. "It is not for this Court to intervene to protect the citizens of this state from the consequences of its policy." The guaranty of equal protection does not require "that the state shall adopt a unifying method of appeals which will insure to all litigants within the state the same decisions on particular questions which may arise." Of course if the constitutional question involved is a Federal question the Supreme Court can be asked to take jurisdiction whether the decision is for or against the asserted Federal right. The Court would probably be inclined to take jurisdiction in any such case where the judgment of the Ohio Court, whether for or against the Federal right, was in fact reached by a vote of two-sevenths of its members.

STATE TAXATION

A decedant in New York owned bonds of the State of Minnesota and certain of its municipalities. Minnesota attempted to impose an inheritance tax upon the transfer of these bonds. The Supreme Court frustrated the attempt. Farmers' Loan and Trust Company *vs.* Minnesota, 280 U.S. 204. In Blackstone *vs.* Miller, 188 U.S. 189, decided 25 years ago, the doctrine was laid down that choses in action are upon transfer subject to taxation at the domiciles of both debtor and creditor; that is, an inheritance tax might be collected by two different states. That case is now definitely overruled, apparently upon the broad ground of the objectionableness of double taxation. Justice Stone concurred on more limited ground and Justice Holmes dissented. The same general doctrine was applied in Baldwin *vs.* Missouri, 281 U.S. 586.

Last year in Macallen *vs.* Massachusetts, 279, U.S. 620, the Court held void a law of Massachusetts that imposed a franchise tax based upon the net income of the corporation so far as that income included income from Federal securities. It was not greatly surprising, therefore, that a Missouri law was also held void which imposed a tax on insurance companies based upon the net value of all assets including Federal securities. (Missouri *vs.* Gehner, 281 U.S. 313.)

It is a commonplace of the law that

a person seeking redress against governmental action must exhaust all administrative remedies that the law affords before seeking the aid of the courts. An unusual case arose in Missouri. The Supreme Court of the state had held that the state Tax Commission had no power to grant relief in certain tax situations the details of which are unimportant here. Some years later the state court overruled this decision and held that a particular plaintiff could not avail himself of the aid of the courts because he had failed to appeal to the Commission for relief. Manifestly under the law as it stood under the previous decision he could not have done so. Reversing this later judgment of the state court the Supreme Court of the United States declared: "It is plain that the practical effect of the judgment of the Missouri court is to deprive the plaintiff of property without affording it at any time an opportunity to be heard in its defense." Brinkerhoff-Faris T. and S. Co. *vs.* Hill, 281 U.S. 673.

JURY TRIAL

Patton *vs.* United States, 281 U.S. 276, involved the circumstance of a juror's becoming incapacitated during the progress of a criminal trial for a felony. The defendant as well as the government consented to continue the trial with the eleven remaining jurors. The defendant was convicted and sentenced to a term in the penitentiary. He thereafter contended that he had had no power to waive his constitutional right to a trial by a common law jury of twelve men. The Court refused to sustain this contention. It was held that there was no difference between a waiver of one juror and a waiver of jury trial altogether. On this point the decisions of lower United States courts as well as of state courts are in conflict. The Court took the view that the guaranty of jury trial is solely for the protection of the accused and that no public policy beyond this right is involved in the requirement. Much was made of the fact that the accused may always plead guilty and thus waive the right to any trial at all. That being so, argued the Court, why may he not also waive his right to a particular form of trial? Although the right to waive jury trial in the case of petty offenses had previously been established in Schick *vs.* United States, 195 U.S. 65, this was the first case in which the same rule was applied to trials for serious offenses.

LABOR

The most important labor case decided during the year was Texas and N. O. R. Co. *vs.* Brotherhood of Railway and S.S. Clerks, 281 U.S. 548. The Railway Labor Act of 1926 prohibits the exercise of interference, influence, or coercion by either railway employers or railway employees over the self-organization or designation of representatives of the other. Such a prohibition was held to be within the constitutional power of Congress to regulate commerce. It was also held not to deprive railway employees of any rights guaranteed to them under the First Amendment or the due process clause of the Fifth Amendment. Although the law prescribed no punishment for violation of this prohibition and did not expressly provide any equitable remedy, the Court held that a petition for injunction against the activities of a railway company which sought to promote the organization of a labor union among its own employees as opposed to the Brotherhood organization, was an appropriate remedy.

NATIONAL STATESMEN

By James Hart

Associate Professor, Johns Hopkins University

JUDICIAL STATESMEN

Chief Justice Hughes.—The year 1930 witnessed the death of Chief Justice William Howard Taft, and thus the end of a notable political figure who had been the only man to hold the two highest posts in our government. Charles Evans Hughes resigned from the World Court to accept appointment to the Chief Justiceship. Attacks by Senators upon his conservative economic opinions may cause the Supreme Court to swing back from the conservative reaction which has resulted in ten years in holding 30 per cent of the state statutes tested before it for "due process" to be unconstitutional.

Justice Holmes.—In March the veteran judicial statesman, Mr. Justice Oliver Wendell Holmes, reached his 89th year. His statesmanlike insight in constitutional interpretation is worthy of John Marshall; while as a pioneer in legal philosophy he is in a class by himself among America's great jurists.

Justice Roberts.—Owen J. Roberts is an able lawyer; but he is only on the threshold of his Supreme Court career.

Frank B. Kellogg.—During 1930 Frank B. Kellogg was elected a judge of the Permanent Court of International Justice to fill the vacancy created by the Hughes resignation.

CONGRESSIONAL STATESMEN

Speaker Longworth.—The suave but effective Speaker, Nicholas Longworth, supported by Representative Tilson, of Connecticut, the floor leader for the Republicans, held the House more or less in line with the Administration's legislative program against an anti-Hoover Senate. This leadership did not, however, prevent the overriding of the Spanish War veteran's bill veto nor restrict the tariff bill to limited revision.

The Democratic floor leaders, Senator Robinson, of Arkansas, and Representative Garner, of Texas, showed signs of political astuteness when, after the election, they joined with Smith, Cox, and Davis, the Democratic "also rans," and Raskob and Shouse, of Democratic headquarters, in promising support of the President's relief measures in the short session. This did not result, however, in the acceptance of the President's measures as "adequate." The game of politics, looking to 1932, went on.

Senator Caraway.—Senator Caraway's rough inquisition in the so-called lobby investigation raised significant issues of political science; but the Senator was made to look ridiculous when that powerful ecclesiastical statesman, Bishop Cannon, called his "bluff."

Senator Grundy.—Senator Grundy's alleged engineering of tariff "reform," coupled with his punctilious refusal to vote for a rate in which he was personally interested, brought him into prominence, until he lost to Secretary Davis in the primary which nominated a candidate for the unexpired Vare term.

ADMINISTRATIVE STATESMEN

Hurley and Doak.—Patrick J. Hurley and William N. Doak succeeded to vacancies in the Secretaryships of War and Labor, the former by promotion from below.

Alexander Legge led the Federal Farm Board, of which he is chairman, into interesting economic experiments in trying to aid agricultural marketing coöperatives, and especially in an unsuccessful effort to stabilize the price of wheat by trading on the market. He also preached restriction of output to the wheat farmer. The grain merchants became alarmed by the Farm Board's active aid to the coöperative movement.

Secretary Stimson handled foreign affairs in a business-like and effective manner. He was chief of the delegation to the London conference, and recognized promptly the new *régimes* established by several South American revolutions.

Secretary Hyde had an active share in the President's drought relief plans.

Colonel Arthur Woods was given the job of securing jobs for the unemployed.

Woodcock.—Federal District Attorney Amos Woodcock, chosen to head the reorganized prohibition enforcement machinery now in the Department of Justice, is a sane and sincere dry whom wets are forced to respect.

Fletcher.—It is yet too early to tell whether Henry P. Fletcher and his colleagues on the reorganized Tariff Commission will be able to correct the inequalities in the Tariff Act of 1930 which led the President to sign the bill with a distinct tone of apology to his fellow "economists."

Federal Power Commission.—Serious criticism has been made of appointments to the newly reorganized Federal Power Commission. The potential importance of this agency for statesman-like exercise of authority will be given a preliminary test in 1931.

PRESIDENTIAL POSSIBILITIES

Ritchie.—Albert C. Ritchie's election as a pronounced wet for a fourth consecutive term as governor of Maryland strengthens his position as Maryland's "favorite son." The growing strength of the "wet cause" leads Maryland Democrats to keep up hope for "Our Bert."

Roosevelt.—Governor Franklin D. Roosevelt's reelection in New York keeps his "availability" at a fair percentage, despite criticism in certain quarters that he was not vigorous enough in inquiring into the alleged Tammany sale of judgeships. Governor Roosevelt is a wet, and had stressed the power issue.

Owen D. Young still remains the most eminent Democrat, if eminence means anything for "availability."

Morrow.—On the Republican side, Dwight Morrow's prestige continued to wax. He was a member of the American delegation to the London conference; and returned to wind up his eminently successful Mexican ambassadorship, and to be an easy victor in the New Jersey primary and election as candidate for the United States Senate. The Jersey statesman stood squarely for repeal of the 18th amendment. It has helped his meteoric political advance that Colonel Lindbergh is his son-in-law. So frequently was Marrow mentioned for the presidency that he came out for Hoover in 1932. The present value of his chances for the 1936 Republican nomination is rather high.

Gifford Pinchot was returned to the governor's chair in Pennsylvania after an absence. He is dry, and his vigorous attacks forced Republican utility interests to oppose him. His chances for the Republican nomination seem slim.

THE PROHIBITION CONTROVERSY

By Irving Fisher

Professor, Yale University

INTRODUCTORY

Justice Clark's Decision.—The most sensational development in relation to prohibition since the adoption of the Eighteenth Amendment was the decision handed down by Justice Clark of Newark, N. J., Dec. 16, 1930, pronouncing the Amendment unconstitutional because this particular Amendment should have been proposed and ratified by State conventions instead of being proposed by Congress and ratified by State legislatures. An immediate appeal to the Supreme Court was taken by the United States Government.

Justice Lowell's Ruling.—On Dec. 29, Justice Lowell of the Federal District Court for Massachusetts ruled that the decisions of the Supreme Court in 1920 in Rhode Island *vs.* Palmer, and in Hawks *vs.* Smith, had settled the constitutionality of the Amendment. In dismissing a motion to quash an indictment, he said: "I have no power to grant your motion in the face of the decisions of the Supreme Court of the United States, and Judge Clark had no power to grant the motion he granted." Further on he declared: "I might sit down and write an essay, but what power have I to say anything when the Supreme Court has already ruled? I might thumb my nose at the Supreme Court, but what good would that do? I might disagree with them, but I won't." This seems to foreshadow the fate of Justice Clark's ruling when it is taken up by the Supreme Court. There is no word in the Constitution to indicate that certain amendments belong to a higher order and can be adopted only by pursuing a special procedure. The Supreme Court in the rulings cited above decided unanimously that "the method of ratification is left to the choice of Congress. Both methods of ratification, by the legislature or convention, call for action by deliberative assemblies of the people, which was assumed would voice the will of the people."

Political Considerations.—The congressional and state referenda supplied tests of the *Literary Digest's* "straw vote" which had reported an overwhelming majority of the American people as opposed to the Eighteenth Amendment and as favorable to its repeal or modification. The Congressional and state elections recorded wet gains, but, taking the wet claims at their face value, the elections nevertheless returned an overwhelming dry majority to the new Congress.

PUBLIC SENTIMENT

Straw Votes.—Of 20,000,000 ballots sent out in its Prohibition poll, the *Literary Digest* reported, May 24, the receipt of 4,806,464 correctly marked ballots. For enforcement of Prohibition the vote was 1,464,098, or 30.46 per cent of the total. For outright repeal there were 1,943,052 ballots, or 40.43 per cent, and for modification of the Eighteenth Amendment, permitting light wines and beer, 1,399,314, or 29.11 per cent. The *Harvard Crimson* of March 26 published results of the straw vote taken by 14 eastern and midwestern colleges on Prohibition showing that of the 24,000 students who voted, more than 15,000, voting wet, admitted that they drank liquor, compared with 8,509 who were abstainers. Of the total it was reported that only 838 students admitted they were in favor of continuing the present prohibition regime, while 11,006 favored modification of the dry laws, and 5,589 favored total repeal. The University of Pennsylvania alone of these 14 universities returned a majority in favor of the dry law. The National Economic League, composed of many of the nation's business, industrial, political and financial leaders, reported, Dec. 14, a straw vote indicating that 55 per cent of those voting favored repeal of the Eighteenth Amendment, and that 41 per cent opposed repeal. The total number of ballots cast was 2,633 out of 5,500 distributed; of these, 1,440 voted for repeal and 1,090 against, while 103 were not recorded on this question.

Election Returns.—No definitive lists of wet and dry Congressmen chosen during the fall elections have been published. Only estimates, in figures, have been reported from wet and dry headquarters and in the newspapers. The wet claim made by Henry H. Curran, President of the Association Against the Prohibition Amendment, was published Nov. 6, as follows: "Congress still lags behind the sentiment of the people. Yet even in Congress the 15 repeal Senators of the last Senate have now increased to 20 in the next Senate, consisting of 9 Republicans and 11 Democrats, a gain of one-third. The 75 repeal Representatives in the last House have now increased to 145 repeal Representatives for the next House, consisting of 74 Republicans and 71 Democrats, almost doubling the former number. . . . The people are now about 3-to-1 in favor of immediate repeal." Opposed to this claim is the statement by Superintendent F. Scott McBride of the Anti-Saloon League of America, Nov. 6: "In this year's election 35 Senators were chosen, and of these, 29 are dry and 6 are wet. . . . The next Senate will have at least 10 more drys than the number that voted for the submission of Prohibition, and the vote then was 65 to 20. In the House the election returns show that about a dozen drys were defeated by wets, and these, added to the 11 drys lost in the primary, will mean a total loss of about two dozen in the House. This leaves more than 300 drys in the next House and less than 135 wets, 20 more drys than submitted the Eighteenth Amendment. This estimate is generous to the wets." A third estimate, that of *The New York Times*, was published Nov. 9: "A total of 133 wets was elected to the next House of Representatives, a gain of 42. The line-up in the Senate is virtually unchanged."

But the *Literary Digest* "straw vote" indicated such a nationwide change of public sentiment that 69.54 per cent of those voting were recorded as favoring outright repeal of the Eighteenth Amendment or a change permitting light wines and beer. There was no doubt of the dominance of the wet-dry issue in the campaign. Richard V. Oulahan, chief Washington correspondent of *The New York Times*, reported in its issue of Oct. 26: "Except in the greater part of the South, where candidates for the office of Senator or Representative generally proclaim themselves dry, there is hardly a State in which Prohibition has not become an issue in one aspect or another. More often than heretofore, it enters into Senatorial battles. As for wet candidates for the House, they are legion."

Yet the most optimistic claim for the wets, that of Mr. Curran, shows only 145 wets out of 435 representatives elected to the new Congress, or 33⅓ per cent wet, compared with the *Literary Digest's* straw vote majority of 70 per cent wet. Critics of the *Literary Digest* vote point out that the list of names addressed by the *Digest* were taken from telephone directories, which contain the names of ten times as many men as of women, and that further bias resulted from the fact that there are many more telephones in proportion to population in the cities, thus exaggerating the wet sentiment in cities and underrepresenting the rural sections which are largely dry. That a dry Congress was returned may be explained by the fact that more women and more of the rural districts were represented in the election than in the *Literary Digest* straw vote. The *Literary Digest* poll was borne out in demonstrable degree only in three states,—Rhode Island, Illinois and Massachusetts,—which have been recorded as wet during the entire period of national prohibition. Rhode Island, in fact, never ratified the Eighteenth Amendment. Massachusetts and Illinois have been on record in several previous referenda as wet strongholds. The vote in Massachusetts, which was binding, recorded 641,967, or 64 per cent, as favoring repeal of the state Enforcement Act, and 367,165, or 36 per cent, as opposed. Illinois voted 32 per cent dry and 68 per cent wet on its separate proposals for repeal of the Eighteenth Amendment and modification of the Volstead Law. Rhode Island voted 22 per cent dry and 78 per cent wet in its referendum for repeal of the Eighteenth Amendment. In wet New York there was no contest, as Franklin D. Roosevelt, wet Democratic candidate for governor, was elected against a wet Republican opponent, Charles H. Tuttle. In Ohio, George White, and in Pennsylvania, Gifford Pinchot, outstanding drys, won against wet opponents in the gubernatorial contests.

LEGISLATION

Transfer of Prohibition Bureau.—The Williamson Bill authorizing transfer of the Prohibition Bureau from the Treasury to the Department of Justice was passed by Congress on May 19 and became effective July 1.

State Enforcement.—In his monograph "State Coöperation in the Enforcement of Prohibition," Dr. James M. Doran points out that 43 States have laws adequate for the enforcement of the Eighteenth Amendment; further, that the five States which have not, may rely on their penal codes which empower them to act under the provisions relating to common nuisances. He adds that where close coöperation between city, country and state officials with the Federal officers is had, there is good enforcement.

JUDICIAL DECISIONS

Liquor Purchase.—In a decision handed down May 26, the U. S. Supreme Court declared, in the case of the United States *vs.* James E. Farrar, that the purchaser of intoxicating liquor for beverage purposes is not guilty of an offense under the Volstead Act.

Container Sellers.—In the case of Ike Danovitz *vs.* United States, the Supreme Court on May 5 decided that persons who sell barrels, bottles, corks, labels, cartons, and so forth, are subject to punishment under the Volstead Act.

Liquor Permits.—On May 26, the Supreme Court handed down five decisions which provide that a liquor permit once granted cannot be withdrawn by regulations or by administrative action, or in any other way, save by surrender of the permit by the permittee, or for failure to maintain a supporting bond, or by revocation because the national prohibition act has been violated.

Jones Law Convictions.—The Supreme Court declined, Oct. 13, to review two convictions under the Jones Law in Missouri involving heavy penalties.

ADMINISTRATION

Commission on Law Enforcement and Observance.—In its preliminary report, Nov. 21, 1929, the Commission recommended that the investigation in preparation of cases against violators of the prohibition laws be transfered from the Treasury Department to the Department of Justice; that the enforcement laws be codified; that provision be made for strengthening the so-called padlock injunction, and that the Federal Courts be relieved of the congestion of petty prosecutions by increasing the number of Federal Judges and by creating inferior Federal police courts for such cases. In his address at the annual meeting of the American Bar Association, Aug. 20, 1930, George W. Wickersham, Chairman of the Commission, said: "It was perhaps natural that the press and the public should have assumed that the Commission's task was primarily to investigate and report on the question of prohibition, and that somehow it would furnish a solution of that most controversial subject. But as President Hoover pointed out in his statement of June 27 of this year, statistics show that 70 per cent of all prisoners in Federal prisons are there for other crimes than those arising out of prohibition, and our State Prisons show about the same ratio. Therefore, a balanced inquiry into the problem submitted would consider prohibition as one only of a number of elements to be studied."

In a speech, June 9, before the National Conference of Social Workers in Boston, Mr. Wickersham had asserted that the English system of promoting temperance by education and restriction of liquor sales had proved more effective than the American method of Prohibition with harsh penalties for violation, such as that of the Jones Law, which made every violation of the prohibition laws, with the exception of illegal possession and maintenance of a nuisance, a potential felony. On Oct. 8, Mr. Wickersham was quoted as saying that "If Prohibition proves unenforceable, this Commission should say so," and expressed the hope that the Commission would have something definite on which to report during the Congressional session of 1930-1931. On March 26, Mr. Wickersham, testifying before the Senate Judiciary Committee, favored modification of the Jones Act and made other recommendations for more effective enforcement of the prohibition laws. No report of the Committee was made during the December meeting of Congress.

Transfer of Prohibition Bureau.—A statute making this transfer was enacted by Congress in May, and on July 1, the detection and prosecution of offenses against the Prohibition laws was taken over by the Department of Justice. Col. A. W. Woodcock, U. S. Attorney for the District of Maryland, was selected as Director. Dr. James H. Doran, who had served as Commissioner of Prohibition in the Treasury, became Commissioner of Industrial Alcohol, and this phase of Prohibition administration remained in the Treasury, with 12 supervisors and 87 deputy supervisors to serve in each of the judicial districts with deputy administrators of enforcement. Simultaneously there came into being in the Treasury a Bureau of Narcotics created by special legislation to curtail growth of the drug habit.

The first regulation promulgated after the transfer to the Department of Justice made all previous regulations operative until Sept. 1, together with interchange of information between the two departments respecting issuance of permits.

Attorney General Mitchell made known, Jan. 27, his purpose not to appoint men as United States Attorneys, their assistants, or United States marshals, unless they are in sympathy with the national prohibition act and refrain from using alcoholic beverages. In his statement, June 26, Mr. Mitchell requested more help from state and local governments in enforcing the liquor laws and announced the rearrangement of the 27 existing prohibition districts into 12 new districts.

PROHIBITION ENFORCEMENT

Limitation of industrial alcohol output to actual needs of legitimate industry, began in 1928, "has proved to be successful," as reported by Dr. James J. Doran in his annual report covering the fiscal year 1929-1930. By this plan a fixed quota of the total alcohol to be produced is allotted to each industrial alcohol plant, providing that only 40 per cent of the year's quota be produced during the first six months, unless legitimate industry requests an excess of that amount. During the fiscal year 191,859,342 proof gallons were produced, a decline of 8,972,708 gallons from the preceding year, chiefly due to the business depression.

Court Proceedings.—Dr. Doran reported that enforcement activities resulted in 68,173 arrests during the year, and the seizure of 8,633 automobiles and 64 boats. Court proceedings against 72,673 persons were terminated in Federal Courts, resulting in 54,085 convictions, following which 22,405 jail sentences were imposed. The average jail sentence, based on every conviction, was 94.3 days. The courts imposed sentences aggregating 14,172 years, and fines amounting to $6,678,732. The courts suspended, paroled, and probated sentences aggregating 5,305 years. Federal Prohibition agents also made arrests or assisted in obtaining evidence in a large number of cases against individuals prosecuted in State courts. There were 8,449 cases terminated and 7,609 convictions obtained. Sentences amounting to 1,563 years in prison and 734,891 in fines were imposed. Fines and penalties covered into the United States Treasury amounted to $4,709,851. In his report covering the fiscal year, Attorney General Mitchell notes that of the 52,437 Prohibition cases terminated, nearly 78 per cent brought pleas of guilty and only about 13 per cent were dismissed, while the rest had jury trials. Jail and prison sentences were imposed in 27,709 cases, 5,107 more than in the fiscal year 1928-1929.

Smuggling. — With respect to smuggling, Assistant Attorney General Youngquist reported that business "as conducted on the high seas and in our territorial waters appears to have undergone "somewhat of a revival" during the fiscal year. Seizures increased from 17 in 1929 to 29 in 1930, while forfeitures decreased from 14 in 1929 to 12 in 1930. Padlockings numbered 8,801, a gain of 2,498 over 1929, and a total of 11,882 such cases were begun.

Miscellaneous. — Dr. Doran, as Chief of the Industrial Alcohol Bureau, announced Dec. 10 that a new denaturing element had been discovered, making possible the elimination of poisons from industrial alcohol. This product is a mixture of alcotate and aldehol which are derived from petroleum undergoing the cracking process. It is described as nauseating to the taste but harmless. Meanwhile the chief source of "bootleg" liquor is corn sugar. Dr. Doran reported, March 21, that raids of Federal prohibition agents in the single month of January had resulted in the capture of 1,600 illicit stills, of which nearly half were large corn sugar plants capable of runs of from 1,000 to 2,000 gallons of pure alcohol aily. Commissioner Woodcock tated, Sept. 27, that the manufacure of wine and beer in the Amerian home for home consumption is irtually beyond the reach of Fedral interference, since search warants issued against private homes an be obtained only on the presentaion of evidence of sales.

LIQUOR CONSUMPTION

The vital question as to the effects f National Prohibition is whether t has reduced the amount of drinkng. In a survey published Oct. 4, he prohibition director, Col. Woodock placed the possible production of llicit liquor of all classes in the nited States for the year ended June 30, at 876,320,718 gallons, or approximately 7 gallons to each person in the United States. Col. Woodcock concluded: "Consumption of alcoholic liquor in the United States is growing less from year to year," and that statements to the contrary were "unwarranted." This estimate was made by surveying the production of the commodities from which liquor is made, and by discounting the amounts of these commodities known to have been used in legitimate manufacture. By comparison with 1914, the last year of normal full production of legal liquor, Commissioner Woodcock calculated that the apparent consumption for the year ended June 30, 1930, was only about 40 per cent of 1914. This estimate relates to gallons of beverage, not gallons of alcohol. The corresponding figure for gallons of actual alcohol is 35 per cent of pre-prohibition figures. Moreover, these figures apply to total consumption, not per capita consumption. The per capita consumption works out as only 27 per cent of pre-prohibition. This means that per capita consumption, according to the Prohibition Bureau's estimate, has been reduced since Prohibition by at least 73 per cent. This estimate is made from figures for the fiscal year 1929-1930, which Col. Woodcock declares to be too large, while those for 1914 are too small. This is because he cannot estimate the exact figures, but can set upper limits to represent possible consumption. For instance, he can tell how much alcohol has been withdrawn, but not how much of that has been diverted. But for 1914, the exact opposite is the case. It is known how much in 1914 paid the excise tax, but not how much, in addition, was bootlegged.

THE ELECTIONS OF 1930

BY THOMAS N. HOOVER

PROFESSOR, OHIO UNIVERSITY

ANALYSIS

Results. — The elections of 1930 have come and gone, with as many conclusions drawn by the people as there are people. As usual, there was a decided loss to the party in power. Many who were carried into Congress by the Hoover landslide of 1928 were made members of the "Lame Duck" aggregation in 1930.

Significance.—As to the significance of the election, there is a diversity of opinion. According to Albert Shaw, in the *Review of Reviews*, the election is not taken seriously. Few people lost sleep over it, and were little disturbed either by the calamity-howling before the election, or by the rejoicing of the wets after the election.

Issues.—On the other hand, the election of 1930 was characterized as a "Political Earthquake", due to the successes of the Democrats. The principal questions were the 18th amendment, unemployment, and in some places the dry weather was even used for political purposes. Senator Copeland, of New York State, said that there was but one issue, and that was unemployment. Others were equally sure that the one issue was the wet and dry issue.

Prohibition.—Since the election, a District Judge in New Jersey has rather injured the cause of the wets by giving a decision which is generally regarded as a wet campaign speech from a Federal court. The election cannot be at all construed to be a solemn referendum on the liquor question.

Parties In Congress.—The membership of the two houses is so evenly divided between Democrats and Republicans, that it will not be known till the 72nd Congress meets whether Nicholas Longworth will continue as speaker.

The election statistics which follow are made possible by the gracious response on the part of the Secretary of State of the states listed.

ARIZONA

Governor

Geo. W. P. Hunt, Dem.	48,875
John C. Phillips, Rep.	46,231

U. S. Representatives

Lewis W. Douglas, Dem. (No opponent)	52,342

ARKANSAS

Governor

Harvey Parnell, Dem.	115,574
J. O. Livesay, Rep.	26,161

U. S. Senator

Joe T. Robinson, Dem.	141,906
Ben H. Greathouse (withdrawn)	439

U. S. Representatives

1. W. J. Driver, Dem.	19,103
2. Jno. E. Miller, Dem.	18,623
3. C. A. Fuller, Dem.	28,809
4. Mrs. Effie Gene Wingo, Dem.	21,700
5. Heartsill Ragon Dem.	21,896
6. D. D. Glover, Dem.	18,127
7. Tillman B. Parks, Dem.	......

CALIFORNIA

Governor

James Rolph, Jr., Rep.	999,393
Milton R. Young, Dem.	333,973
Upton Sinclair, Soc.	50,480

U. S. Representatives

1. Charles F. Lea (on both tickets)	66,703
2. Harry L. Englebright (both tickets)	35,941
3. C. F. Curry (party not designated)	43,336
J. M. Inman (party not designated)	26,785
Frank H. Buck, (party not designated)	9,172
Katherine Babcock, (party not designated)	1,753
4. Florence P. Kahn (on both tickets)	47,397
5. Richard J. Welch (on both tickets)	59,853
6. Albert E. Carter (on both tickets)	110,190
7. Henry E. Barbour (on both tickets)	79,041
8. Arthur Monroe Free (on both tickets)	93,377
9. W. E. Evans, Rep.	182,176
10. Joe Crail, Rep.	162,502
J. F. Dockweiler, Dem.	54,231
11. Phil D. Swing (on both tickets)	124,092

CONNECTICUT

Governor

Rogers, Rep.	209,607
Cross, Dem.	215,072

U. S. Representatives

1. Seymour, Rep.	50,877
Lonergan, Dem.	51,551
2. Freeman, Rep.	27,801
Fox, Dem.	33,029
3. Tilson, Rep.	45,329
Shanley, Dem.	40,269
4. Merritt, Rep.	49,209
Tierney, Dem.	50,769
5. Goss, Rep.	33,302
Gormley, Dem.	32,584

(Goss was also elected to fill vacancy in 71st Congress.)

DELAWARE

U. S. Senator—Long Term

Thomas F. Bayard, Dem.	37,693
Daniel O. Hastings, Rep.	47,909
Nicholas Minutella, Com.	135
Thomas F. Bayard, Lib. R.	2,188

U. S. Senator—Short Term

Thomas F. Bayard, Dem.	37,098
Daniel O. Hastings	47,665
Nicolas Minutella, Com.	118
Thomas F. Bayard, Lib. R.	2,181

U. S. Representatives

John P. LeFevre, Dem.	36,873
Robert G. Houston, Rep.	48,493
Arnold Williams, Com.	127
John P. LeFevre, Lib. R.	2,018

FLORIDA

U. S. Representatives

1. Herbert J. Drane, Dem.	24,792
L. E. Womack, Rep.	11,819
2. R. A. Green, Dem.	7,060
3. Tom A. Yon, Dem.	11,796
4. Ruth Bryan Owen, Dem.	40,422

GEORGIA

Governor

Richard B. Russess, Dem.
(votes not given)

U. S. Senator

William J. Harris, Dem.	55,606

U. S. Representatives

1. Chas. G. Edwards, Dem.	2,465
2. E. E. Cox, Dem.	2,518
3. Charles R. Crisp, Dem.	2,440
4. W. C. Wright, Dem.	2,721
5. Robert Ramspeck, Dem.	10,752
6. Samuel Rutherford, Dem.	4,333
7. M. C. Tarver, Dem.	5,590

8.	Charles H. Brand, Dem.	5,058
	W. N. Phillips, Rep.	389
9.	John S. Wood, Dem.	7,089
	Thos. M. Bell, Dem.	3
10.	Carl Vinson	2,691
11.	W. C. Lankford, Dem.	6,552
	H. J. Carswell, Rep.	1,526
12.	W. W. Larsen, Dem.	2,444

IDAHO

Governor

John McMurray, Rep.	58,002
C. Ben Ross, Dem.	73,896

U. S. Senator

William E. Borah, Rep.	94,938
Joseph M. Tyler, Dem.	36,162

U. S. Representative

1.	Burton L. French, Rep.	34,527
	Compton I. White, Dem.	18,657
2.	Addison T. Smith, Rep.	46,342
	W. F. Alworth, Dem.	27,004

INDIANA

U. S. Representatives

1.	Harry E. Rowbottom, Rep.	40,015
	John W. Boehne, Jr., Dem.	46,836
2.	Ray S. Sissin, Rep.	35,689
	Arthur H. Greenwood, Dem.	52,452
3.	James W. Dunbar, Rep.	44,808
	Eugene B. Crowe, Dem.	45,070
4.	Scott Thompson, Rep.	34,856
	Harry C. Canfield, Dem.	46,396
5.	Noble J. Johnson, Rep.	40,919
	C. C. Gillen, Dem.	43,355
6.	R. M. Elliott, Rep.	37,969
	W. H. Larrabee, Dem.	40,803
7.	A. M. Hall, Rep.	53,822
	Louis Ludlow, Dem.	87,777
8.	A. H. Vestal, Rep.	44,203
	C. C. Ball, Dem.	44,194
9.	F. S. Purnell, Rep.	43,681
	H. L. Matlock, Dem.	43,346
10.	W. R. Wood, Rep.	53,702
	C. J. Murphy, Dem.	47,057
11.	A. R. Hall, Rep.	39,771
	Glen Griswold, Dem.	41,823
12.	D. R. Hogg, Rep.	43,286
	T. P. Riddle, Dem.	39,488
13.	A. J. Hickey, Rep.	59,361
	S. B. Pettengill, Dem.	62,609

ILLINOIS

U. S. Senator

Ruth Hanna McCormick, Rep.	687,469
J. Hamilton Lewis, Dem.	1,432,216
Lottie Holman O'Neill, Ind.	99,485
George Koop, Soc.	11,192

U. S. Representatives at Large

Richard Yates, Rep.	991,083
Frank L. Smith, Rep.	890,327
Wm. H. Dieterich, Dem.	1,062,606
Walter Nesbitt, Dem.	975,422
E. Z. Levitin, Soc.	9,526
Morris A. Gold, Soc.	9,207

U. S. Representatives

1.	Oscar DePriest, Rep.	23,719
	Harry Baker, Dem.	16,747
2.	Morton D. Hull, Rep.	76,665
	M. C. Walsh, Dem.	63,341
3.	Elliott W. Sproul, Rep.	59,644
	Edward A. Kelly, Dem.	83,028
4.	F. G. Zelezinski, Rep.	16,192
	Harry P. Beam, Dem.	36,736
5.	Frank V. Kara, Rep.	10,816
	Adolph J. Sabath, Dem.	21,460
6.	H. R. Lundblad, Rep.	59,052
	James T. Igoe, Dem.	120,408
7.	J. C. Moreland, Rep.	90,844
	Leonard W. Schnetz, Dem.	111,525
8.	Peter C. Granata, Rep.	16,565
	Stanley H. Krinz, Dem.	15,394
9.	Fred A. Britten, Rep.	24,028
10.	John E. Hesse, Dem.	70,621
	Carl R. Chindblom, Rep.	72,938
11.	Frank R. Reid, Rep.	56,957
	Elmer P. Schaefer, Dem.	33,169
12.	John T. Buckbee, Rep.	55,754
	R. J. O'Halloran, Dem.	17,497
13.	William R. Johnson, Rep.	28,113
	John A. Ascher, Dem.	11,937
14.	John C. Allen, Rep.	36,370
	W. H. Hartzell, Dem.	27,592
15.	Burnett M. Chiperfield, Rep.	35,114
	(Short term)	34,063
	J. H. Paxton, Dem.	27,031
	(Short term)	26,467
16	Wm. E. Hull, Rep.	36,572
	E. S. Carr, Dem.	32,692
17.	Homer W. Hall, Rep.	36,572
	C. S. Schneider, Dem.	19,711
18.	William P. Holaday, Rep.	38,102
	Charles R. Hill, Dem.	29,012
19.	Charles Adkins, Rep.	43,794
	Charles M. Borchers, Dem.	35,310
20.	W. J. Thornton, Rep.	20,262
	Henry T. Rainey, Dem.	37,537
21.	R. E. Chapin, Rep.	34,521
	J. Earl Major, Dem.	46,058
22.	E. M. Irwin, Rep.	47,715
	Charles A. Karch, Dem.	48,281
23.	J. F. Allen, Rep.	29,291
	Wm. W. Arnold, Dem.	49,111
24.	J. V. Heidinger, Rep.	27,296
	Vacancy	26,732
	Claude V. Parsens, Dem.	27,325
	Vacancy	26,929
25.	E. E. Denisen, Rep.	34,927
	Kent E. Keller, Dem.	38,796

KANSAS

U. S. Senator—Unexpired Term

George McGill, Dem.	288,889
Henry J. Allen, Rep.	276,833
H. M. Perkins, Soc.	11,659

U. S. Senator—Regular Term

Arthur Capper, Rep.	364,548
Jonathan M. Davis, Dem.	232,161

Governor

Harry H. Woodring, Dem.	217,171
Frank Haucke, Rep.	216,920
J. R. Brinkley	183,278
J. B. Shields, Soc.	3,866

U. S. Representatives

1.	W. P. Lambertson, Rep.	53,799
2.	U. S. Guyer, Rep.	49,844
	Chauncey B. Little, Dem.	37,991
3.	Harold McGuggin, Rep.	42,106
	Earl Knight, Dem.	37,807
4.	Homer Hoch, Rep.	30,840
	James E. Hilkey, Dem.	21,933
5.	James G. Strong, Rep.	33,871
	Clyde Short, Dem.	28,971
6.	Charles I. Sparks, Rep.	40,132
	Robert Good, Dem.	24,975
7.	Clifford R. Hope, Rep.	52,858
	A. S. Allphin, Dem.	33,627
8.	W. A. Ayres, Dem.	57,173
	Stella B. Haines, Rep.	19,325

KENTUCKY

U. S. Senator—Long Term

	John Marshall Robsion, Rep.	303,180
	M. M. Logan, Dem.	336,718

U. S. Senator—Short Term

	John Marshall Robison, Rep.	297,510
	Ben Williamson, Dem.	327,723

U. S. Representatives

1.	W. V. Gregory, Dem.	24,622
2.	Glover H. Cary, Dem. (Long term)	21,685
	John L. Dorsey, Dem. (Short term)	21,406
3.	John W. Moore, Dem.	25,981
4.	John Durrett, Rep.	28,220
	Cap R. Curden, Dem.	30,910
5.	Maurice H. Thacher, Rep.	61,832
	C. W. Merrett, Soc.-Labor	1,306
6.	J. Lincoln Newhall, Rep.	18,891
	Brent Spence, Dem.	31,520
	Blaine McLaughlin, Ind.	4,746
	John J. Thobe, Soc.	199
7.	Robert Blackburn, Rep.	24,380
	Virgil Chapman, Dem.	33,402
8.	Patrick Taylor, Rep.	19,023
	Ralph Gilbert, Dem.	25,688
9.	Elva R. Kendall, Rep.	28,850
	Fred Vinson, Dem.	42,671
10.	Mrs. John W. Langley, Rep.	24,172
	A. J. May, Dem.	27,159
11.	Chas. Finley, Rep.	48,535
	W. W. Duffield, Dem.	24,716

LOUISIANA

U. S. Senator

	Huey P. Long, Dem.	130,536

U. S. Representatives

1.	J. O. Fernandez, Dem.	30,629
	John B. Murphy, Rep.	1,335
2.	Paul H. Maloney, Dem.	30,739
	Henry J. Veith, Rep.	872
3.	Numa F. Montet, Dem.	8,517
4.	John N. Sandlin, Dem.	11,833
5.	Riley J. Wilson, Dem.	11,168
6.	Bolivar E. Kemp, Dem.	15,524
7.	Rene L. DeRouen, Dem.	9,293
8.	James B. Aswell, Dem.	12,383

MAINE

Governor

	Wm. Tudor Gardiner, Rep.	82,310
	Edward C. Moran, Jr., Dem.	67,172

U. S. Senator

	Wallace H. White, Jr., Rep.	88,262
	Frank H. Haskell, Dem.	55,559

U. S. Representatives

1.	Carroll L. Beedy, Rep.	23,434
	Thomas F. Locke, Dem.	14,741
2.	Donald B. Partridge, Rep.	24,330
	Albert Beliveau, Dem.	18,943
3.	John E. Nelson, Rep.	25,109
	Leo D. Lamond, Dem.	13,948
4.	Donald F. Snow, Rep.	15,199
	Clinton C. Stevens, Dem.	7,839

MARYLAND

Governor

	Albert C. Ritchie, Dem.	283,639
	W. F. Broening, Rep.	216,864
	Elisabeth Gilman, Soc.	4,178
	Samuel Parker, Com.	855
	R. W. Stevens, Labor	1,358

U. S. Representatives

1.	T. A. Goldsborough, Dem.	34,553
	A. S. Marine, Rep.	25,792
2.	Wm. P. Cole, Jr., Dem.	79,963
	L. L. Clark, Rep.	54,914
3.	V. L. Palmisano, Dem.	28,633
	John P. Hill, Rep.	24,170
4.	J. C. Linthicum, Dem.	49,471
	W. O. Atwood, Rep.	26,661
5.	S. W. Gambrill, Dem.	40,315
	A. K. Love, Rep.	21,463
6.	D. J. Lewis, Dem.	42,526
	F. N. Zihlman, Rep.	36,815
7.	Samuel K. Dennis, Dem.	149,782

MICHIGAN

Governor

	Wilber M. Brucker, Rep.	483,990
	William A. Comstock, Dem.	357,664
	George M. Campbell, Soc.	3,903
	Joseph Billups, Workers	3,988
	Duly McCone, Pro.	1,336
	Scattering	

U. S. Representatives

1.	Robert H. Clancy, Rep.	44,021
	William M. Donnelly, Dem.	8,758
	Anthony Gerlach, Workers.	789
2.	Earl C. Michener, Rep.	41,478
	Edward Frensdorf, Dem.	29,979
	William Nowell, Workers	93
3.	Joseph L. Hooper, Rep.	36,190
	Rosslyn L. Sowers, Dem.	14,737
4.	John C. Ketcham, Rep.	34,980
	Roman I. Jarvis, Sr., Dem.	17,953
5.	Carl E. Mapes, Rep.	31,297
	Arnold Ziegler, Workers	420
6.	Seymour H. Person, Rep.	124,797
	Patrick H. O'Brien, Dem.	50,221
	Axel O. Londal, Soc.	1,059
	Philip Raymond, Workers	1,664
7.	Jesse P. Wolcott, Rep.	42,256
	Emerald B. Dixon	2,534
8.	Bird J. Vincent, Rep.	38,891
	Michael J. Hart, Dem.	18,838
9.	James C. McLaughlin, Rep.	31,318
	Loren N. O'Brien, Dem.	10,462
10.	Roy O. Woodruff, Rep.	31,033
	Henry C. Haller, Dem.	8,345
11.	Frank P. Bohn, Rep.	34,971
12.	W. Frank James, Rep.	36,907
	Edwin Multilia, Workers	703
13.	Clarence J. McLeod, Rep.	39,064
	Walter I. McKenzie, Dem.	9,575
	Arthur Rubenstein, Soc.	342
	Philip Bart, W.	567

MINNESOTA

Governor

	Roy P. Chase, Rep.	289,528
	Floyd B. Olson, F.-L.	473,154
	Edward Intrebias, Dem.	29,109
	Karl Reeve, Com.	5,594

U. S. Senator

	Thomas D. Schall, Rep.	293,626
	Ernest L. Undeen, F.-L.	178,671
	Einar Hoidale, Dem.	282,018
	C. A. Lund, Ind.	20,669
	R. Harjic, Com.	5,645

U. S. Representatives

1.	Victor Christgau, Rep.	45,330
	Matt Fitzpatrick, F.-L.	24,357
2.	Frank Clague, Rep.	38,431
	L. A. Fritsche, F.L.	33,092
3.	August H. Andresen, Rep.	35,704
	F. H. Shoemaker, F.-L.	21,118
	Joe J. Moriarty, Dem.	17,485

4.	Melvin J. Maas, Rep.	48,633
	C. V. Hammerstrom, F.-L.	16,180
	Frank Munger, Dem.	6,593
	A. W. Anderson, Com.	1,690
5.	W. I. Nolan, Rep.	55,502
	S. M. Bryan, Dem.	32,215
	Rebecca Reese, Com.	2,847
6.	Harver Knutson, Rep.	44,058
	John Knutsen, F.-L.	19,461
	P. J. Russell, Dem.	9,197
7.	Frank Hopkins, Rep.	13,506
	Paul J. Knole, F.-L.	58,334
8.	Wm. A. Pittinger, Rep.	55,802
	Wm. L. Carss, F.-L.	29,001
	Walter Harjic, Com.	3,318
9.	Conrad G. Selvig, Rep.	37,531
	Knud Wefald, F.-L.	32,874
10.	Godfrey G. Goodwin, Rep.	38,391
	Erling Swenson, F.L.	37,182
	D. I. Moses, Com.	1,931

MISSISSIPPI

U. S. Senator

B. P. Harrison, Dem.	35,953

U. S. Representatives

1.	J. E. Rankin, Dem.	5,378
2.	Wall Doxey, Dem.	4,202
3.	W. M. Whittington, Dem.	4,282
4.	Jeff Busby, Dem.	4,017
5.	Ross A. Collins, Dem.	5,109
6.	Robt. S. Hall, Dem.	5,995
7.	Percy E. Quin, Dem.	3,356
8.	J. W. Collier, Dem.	2,560

MISSOURI

No statistics from Missouri were available. The following were elected as members of the House of Representatives in Congress:

1. M. A. Ronjue, Dem.
2. Ralph F. Lozier, Dem.
3. Jacob L. Milligan, Dem.
4. David Hopkins, Rep.
5. Joseph B. Shannon, Dem.
6. C. C. Dickinson, Dem.
7. Sam C. Major, Dem.
8. Wm. L. Nelson, Dem.
9. Clarence Cannon, Dem.
10. Henry F. Niedringhaus, Rep.
11. John J. Cochran, Dem.
12. L. C. Dyer, Rep.
13. Clyde Williams, Dem.
14. James F. Fulbright, Dem.
15. Joe J. Manlove, Rep.
16. Wm. E. Barton, Dem.

MONTANA

U. S. Senator

Thomas J. Walsh, Dem.	106,274
Albert J. Galen, Rep.	66,724
C. E. Taylor, F.-L.	1,789
John F. McKay, Soc.	1,006
W. L. Wright, Com.	368

U. S. Representatives

1.	John M. Evans, Dem.	39,166
	M. D. Fitzgerald, Rep.	29,793
2.	Tom Stout, Dem.	45,438
	Scott Leavitt, Rep.	52,943

NEBRASKA

Governor

Arthur J. Weaver, Rep.	215,615
Charles W. Bryan, Dem.	222,161

U. S. Senator

George W. Norris, Rep.	247,118
Gilbert M. Hitchcock, Dem.	172,795

U. S. Representatives

1.	Ralph S. Moseley, Rep.	19,589
	John H. Morehead, Dem.	34,662
2.	Malcolm Baldridge, Rep.	34,114
	E. R. Burke, Dem.	33,276
3.	H. Halderson, Rep.	23,599
	Edgar Howard, Dem.	53,221
4.	Charles H. Sloan, Rep.	28,196
	J. N. Norton, Dem.	35,812
5.	F. G. Johnson, Rep.	27,932
	A. C. Shallenberger, Dem.	34,915
6.	Robert G. Simmons, Rep.	65,766
	John McCoy, Dem.	24,519

NEVADA

Governor

S. S. Arentz, Rep.	18,279
M. J. Sullivan, Dem.	15,343

U. S. Representatives

Fred B. Bolzar, Rep.	18,442
C. L. Richards, Dem.	16,192

NEW HAMPSHIRE

Governor

John G. Winant, Rep.	75,518
Albert W. Noone, Dem.	54,441
Fred B. Chase, Com.	288

U. S. Senator

Henry W. Keyes, Rep.	72,225
Albert W. Noone, Dem.	52,284
Henry C. Iram, Com.	282

U. S. Representatives

1.	Fletcher Hale, Rep.	37,570
	Napoleon J. Dyer, Dem.	29,166
2.	Edward H. Wason, Rep.	34,253
	Eaton D. Sargent, Dem.	23,167

NEW JERSEY

U. S. Senator—Full Term

Dwight W. Morrow, Rep.	601,497
Alexander Simpson, Dem.	401,007
Henry Jager, Soc.	4,519
Alex. Kudlik, Soc.-L.	670
D. W. Graham, Com.	1,627
Esther Hill Elfreth, Not Pro.	18,903

(Dwight W. Morrow was elected to fill the unexpired term also.)

U. S. Representatives

1.	Charles A. Wolverton, Rep.	78,019
	Francis G. Herman, Dem.	19,486
2.	Isaac Bacharach, Rep.	67,729
	Hans Froelicher, Dem.	17,125
3.	T. M. Gopsill, Rep.	54,889
	William H. Sutphin, Dem.	57,911
4.	Charles A. Eaton, Rep.	39,019
	Charles Browne, Dem.	28,330
5.	Ernest R. Ackerman, Rep.	65,178
	W. N. Goffrey, Dem.	33,851
6.	Randolph Perkins, Rep.	72,868
	A. C. Hart, Dem.	55,283
7.	George N. Seger, Rep.	35,636
	Harry Joelson, Dem.	29,879
8.	Fred A. Hartley, Rep.	44,038
	Paul J. Moore, Dem.	43,195
9.	Peter A. Cavicchia, Rep.	24,312
	D. F. Minaham, Dem.	20,497
10.	Frederick R. Lehlbach, Rep.	44,435
	E. W. Simms, Dem.	21,539
11.	Irving W. Taft, Rep.	16,087
	Oscar L. Auf der Heide, Dem.	44,691
12.	D. T. Story, Rep.	16,715
	Mary T. Norton, Dem.	53,565

NEW MEXICO

Governor

C. M. Botts, Rep.	55,026
Arthur Seligman, Dem.	62,789
Sam Butler Soc.	278

U. S. Senator

Herbert B. Holt, Rep.	48,699
Sam G. Bratton, Dem.	69,362
R. B. Cochran, Soc.	256

U. S. Representatives

Albert G. Simms, Rep.	51,655
Dennis Chavez, Dem.	65,194
Jno. Whitley, Soc.	299

NEW YORK

Governor

Franklin D. Roosevelt, Dem.	1,770,342
Charles H. Tuttle, Rep.	1,045,342
Robert P. Carroll, Law Pres.	190,666
Louis Waldman, Soc.	120,444
J. D. Crowley, Soc. Lab.	9,096
Wm. Z. Foster, Corn.	18,034

(Votes for Representatives in Congress were not available.)

NORTH CAROLINA

U. S. Senator

J. W. Bailey, Dem.	323,825
G. M. Pritchard, Rep.	209,990

U. S. Representatives

1.	Lindsay C. Warren, Dem.	17,985
2.	John H. Kerr, Dem.	15,987
	E. Dana Dickens, Rep.	1,124
3.	Chas. L. Abernathy, Dem.	20,197
	W. G. Mebane, Rep.	10,215
4.	Edwin W. Pou, Dem.	25,724
	John C. Matthews, Rep.	9,339
5.	F. W. Hancock, Dem.	54,284
	J. F. Reynolds, Rep.	34,258
6.	J. Bayard Clark, Dem.	20,786
	C. Ed. Taylor, Rep.	8,348
7.	Walter Lambeth, Dem.	38,229
	C. G. Spencer, Rep.	26,583
8.	R. L. Doughton, Dem.	44,068
	E. F. Wakefield, Rep.	29,307
9.	A. L. Bulwinkle, Dem.	44,159
	Chas. A. Jonas, Rep.	37,911
10.	G. Weaver, Dem.	......
	Brownlow Juakam, Rep.	......

NORTH DAKOTA

Governor

George E. Shafer, Rep.	133,264
Pierce Blewett, Dem.	41,988
P. J. Barrett, Ind.	5,754

U. S. Representatives

1.	O. B. Burtness, Rep.	41,698
	J. E. Garney, Dem.	14,208
2.	Thomas Hall, Rep.	34,063
	P. W. Lanier, Dem.	25,780
	Alfred Kuntson, Ind.	1,304
3.	J. H. Sinclair, Rep.	50,917
	R. H. Leavitt, Dem.	12,296
	Andrew Omholt, Ind.	2,234

OHIO

Governor

Myers Y. Cooper, Rep.	923,538
George White, Dem.	1,033,171

U. S. Senator—Unexpired Term

Roscoe C. McCulloch, Rep.	864,039
Robert J. Bulkley, Dem.	1,046,610

U. S. Representatives

1.	Nicholas Longworth, Rep.	50,481
	John W. Pattison, Dem.	46,974
2.	Wm. E. Hess, Rep.	46,347
	Charles Sawyer, Dem.	45,761
3.	Roy G. Fitzgerald, Rep.	60,249
	Byron B. Harlan, Dem.	62,107
4.	John L. Cable, Rep.	43,104
	Gainor Jennings, Dem.	37,673
5.	Chas. J. Thompson, Rep.	27,497
	Frank C. Kniffin, Dem.	29,117
6.	Charles C. Kearns, Rep.	33,300
	James G. Polk, Dem.	37,158
7.	Charles Brand, Rep.	50,595
	John L. Zimmerman, Dem.	39,142
8.	Grant E. Mouser, Rep.	35,663
	Carl W. Smith, Dem.	33,906
9.	Wilbur M. White, Rep.	49,498
	Scott Stahl, Dem.	36,375
10.	Thomas A. Jenkins, Rep.	31,836
	H. L. Crary, Dem.	19,157
11.	Ned Thatcher, Rep.	21,339
	Mell G. Underwood, Dem.	37,887
12.	John C. Speaks, Rep.	43,840
	Arthur P. Lamneck, Dem.	59,330
13.	Joe E. Baird, Rep.	35,199
	Wm. L. Fiesinger, Dem.	38,067
14.	Francis Sieberling, Rep.	61,628
	Don W. Harter, Dem.	60,651
15.	C. Ellis Moore, Rep.	35,611
	H. R. McClintock, Dem.	33,968
16.	C. B. McClintock, Rep.	51,113
	Wm. R. Thorn, Dem.	47,237
17.	Wm. M. Morgan, Rep.	43,197
	Charles West, Dem.	45,633
18.	Frank Murphy, Rep.	47,096
	Emerson Campbell, Dem.	30,815
19.	John Cooper, Rep.	53,996
	W. B. Kilpatrick, Dem.	40,960
20.	Max D. Gustin, Rep.	13,824
	Charles A. Mooney, Dem.	42,123
21	George H. Bender, Rep.	29,081
	Robert Crosser, Dem.	30,722
	Gustave Ebding, Ind.	96
22.	Chester C. Bolton, Rep.	91,222
	Edw. F. Carren, Dem.	55,868
	Helen Green, Ind.	13,372

OREGON

Governor

E. F. Bailey, Dem.	62,434
Julius L. Meier, Ind.	135,608
Phil Metschan, Rep.	46,840
Albert Streiff, Soc.-Ind.	3,911

U. S. Senator

L. A. Banks, Ind.	17,488
Charles L. McNary, Rep.	137,231
H. H. Stallard, Ind.	10,573
O. D. Teel, Soc.-Ind.	5,051
Elton Watkins, Dem.	66,028

U. S. Representatives

1.	Wm. A. Delzell, Dem.	44,810
	W. C. Hawley, Rep.	55,855
2.	R. F. Bradford, Dem.	13,061
	Robert R. Butler, Rep.	25,304
3.	F. F. Korell, Rep.	35,483
	Charles H. Martin, Dem.	49,316

OKLAHOMA

Governor

William H. Murray, Dem.	302,021
Ira A. Hill, Rep.	208,575

U. S. Senator

T. P. Gore, Dem.	255,838
W. B. Pine. Rep.	232,589
Edward D. Evans, Ind.	614
Thomas P. Hopley, Ind.	218

U. S. Representatives

1.	Wesley E. Disney, Dem.	41,902
	Charles O'Connor, Rep.	41,642
2.	W. W. Hastings, Dem.	31,093
	E. L. Kirby, Rep.	19,464
3.	Wilburn Cartwright, Dem.	39,943
	Palestine Brice, Rep.	9,721
4.	Tom D. McKeown, Dem.	42,885
	M. L. Matson, Rep.	18,616
5.	F. B. Swank, Dem.	38,255
	U. S. Stone, Rep.	26,943
6.	Jed Johnson, Dem.	35,969
	Ann W. Dillard, Rep.	14,233
7.	Jim V. McClintic, Dem.	29,828
	R. C. Holt, Rep.	8,298
8.	H. B. King, Dem.	22,784
	M. C. Garber, Rep.	351,027
	Richard J. Shive, Ind.	166

PENNSYLVANIA

Governor

Gifford Pinchot, Rep.	1,036,605
Gifford Pinchot, Pro.	31,909
Gifford Pinchot, Ind.	360
	1,068,874
John Hemphill, Dem.	643,170
John Hemphill, Lib.	366,572
John Hemphill, Ind.	462
	1,010,204
Frank Mozer, Com.	5,267
James H. Maurer, Soc.	21,036

U. S. Senator

James J. Davis, Rep.	1,462,186
Sedgwick Kistler, Dem.	523,338
Emmet P. Cush, Com.	6,960
S. W. Bierer, Pro.	24,498
William J. Van Essen, Soc.	26,796

The candidates and votes for Representatives in Congress were not available.

RHODE ISLAND

U. S. Senator

Jesse H. Metcalf, Rep.	112,374
Peter G. Gerry, Dem.	109,615

U. S. Representatives

1.	Clark Burdick, Rep.	40,061
	Samuel W. Smith, Jr., Dem.	29,229
2.	Richard S. Aldrich, Rep.	39,667
	Arthur L. Conaty, Dem.	33,084
3.	William R. Fortin, Rep.	31,889
	Francis B. Condon, Dem.	43,348

Governor

Norman S. Case, Rep.	112,318
Theodore Francis Green, Dem.	108,653

SOUTH DAKOTA

Governor

D. A. McCullough, Dem.	93,954
Warren E. Green, Rep.	107,643
Helge Tangen, Ind.	1,620

U. S. Senator

W. J. Bulow, Dem.	106,317
W. H. McMaster, Rep.	99,595

U. S. Representatives

1.	C. A. Christopherson, Rep.	41,151
	Henry Bormann, Ind.	7,451
2.	Fred H. Hildebrandt, Dem.	32,245
	Royal C. Johnson, Rep.	38,195
	Eino Niva, Ind.	475
3.	Theo. B. Werner, Dem.	21,473
	Wm. Williamson, Rep.	27,083

TENNESSEE

Governor

Samuel Borenstein, Com.	1,296
C. Arthur Bruce, Rep.	85,598
Henry H. Horton, Dem.	153,341

U. S. Senator—Long Term

Sherman Bell, Com.	3,392
Paul E. Devine, Rep.	58,650
Cordell Hull, Dem.	154,131

U. S. Senator—Short Term

W. E. Brock, Dem.	144,019
F. Todd Meacham, Rep.	49,554

U. S. Representatives

1.	B. Carroll Reece, Rep.	18,239
	O. B. Lovett, Rep.	20,893
2.	J. Brown	918
	E. E. Patton, Rep.	13,355
	J. Will Taylor, Rep.	17,840
3.	Sam D. McReynolds, Dem.	21,401
4.	J. R. Mitchell, Dem.	15,269
5.	Ewin L. Davis, Dem.	11,792
	George Motlow	1,032
6.	Jos. W. Byrns, Dem.	13,879
	E. L. Bradbury	990
7.	E. E. Eslick, Dem.	13,927
8.	Gordon Browning, Dem.	14,024
9.	Jere L. Cooper, Dem.	17,979
10.	Thos. B. Collier, Dem.	598
	E. H. Crump, Dem.	23,746
	H. L. Harper	995

TEXAS

U. S. Senator

Morris Sheppard, Dem.	266,550
Doran John Hasely, Rep.	39,047
Guy L. Smith, Soc.	808
W. A. Berry, Com.	296

U. S. Representatives

1.	Wright Patman, Dem.	9,160
	Thomas A. Clarke, Rep.	515
2.	Martin Dies, Dem.	14,236
3.	Morgan G. Sanders, Dem.	8,162
4.	Sam Rayburn, Dem.	9,385
	Floyd Harry, Rep.	1,189
5.	Hatton W. Sumners, Dem.	9,924
	Clinton S. Bailey, Rep.	1,344
6.	Luther A. Johnson, Dem.	12,396
7.	Clay Stone Briggs, Dem.	9,357
8.	Daniel E. Garrett, Dem.	12,877
9.	J. J. Mansfield, Dem.	15,855
	George Seydler, Sr., Rep.	2,239
10.	James P. Buchanan, Dem.	12,780
11.	O. H. Cross, Dem.	10,381
12.	Fritz G. Lanham, Dem.	9,846
13.	Guinn, Williams, Dem.	12,840
	W. C. Witcher, Rep.	1,257
14.	Henry B. Dielman, Dem.	18,707
	Harry M. Wurzbach, Rep.	27,206
15.	John N. Garner, Dem.	20,733
	Carlos G. Watson, Rep.	6,016
16.	R. E. Thomason, Dem.	18,915
	Mitchell Waldrop, Rep.	3,581
17.	Thomas L. Blanton, Dem.	17,199
18.	Marvin Jones, Dem.	26,697
	S. D. Fish, Rep.	1,934

UTAH

U. S. Representatives

1.	Joseph Ririe, Dem.	29,210
	Don B. Colton, Rep.	45,875
	A. W. Clemens, Soc.	402
2.	J. H. Paul, Dem.	33,618
	Frederick C. Loofbourow, Rep.	35,106
	George N. Lawrence, Lib.	10,303
	Otto E. Parsons, Soc.	239

VERMONT

Governor

Stanley G. Wilson, Rep.	52,836
Park H. Pollard, Dem.	21,540

U. S. Representatives

1. John E. Weeks, Rep.	25,170
Joseph A. McNamara, Dem.	18,205
2. Ernest W. Gibson, Rep.	23,904
James Cosgrove, Dem.	5,536

VIRGINIA

U. S. Senator

Carter Glass, Dem	82,833
J. Cloyd Byars, Ind.	19,627
Joe C. Morgan, Soc.	5,529

U. S. Representatives

1. S. Otis Bland, Dem.	7,324
W. A. Rowe, Ind.	705
2. J. T. Deal, Dem.	12,297
M. Lankford, Rep.	14,678
3. A. J. Montague, Dem.	6,134
R. H. Brett, Rep.	853
4. P. H. Drewry, Dem.	4,296
5. T. S. Burch, Dem.	7,095
6. Clifford A. Woodrum, Dem.	5,979
7. J. W. Fishburn, Dem.	13,951
J. A. Garber, Rep.	9,934
8. H. W. Smith, Dem.	11,201
F. M. Brooks,	2,742
J. M. Daniel	184
9. J. W. Flannagan, Dem.	32,802
J. C. Shaffer, Rep.	26,244
10. H. S. Tucker, Dem.	7,229
C. K. Rosser, Ind Rep.	620
M. J. Putnam	563

WASHINGTON

U. S. Representatives

1. Ralph A. Horr, Rep.	43,998
Charles G. Heifner, Dem.	32,365
Jared Heardlick, Soc. Lab.	1,736
John Laurie, Com.	800
2. Lindley H. Hadley, Rep.	47,609
August Toellner, Ind.	1,350
William M. Bouck, F. L.	3,428
L. J. Ady, Com.	703
3. Albert Johnson, Rep.	61,995
4. John W. Summers, Rep.	35,917
5. T. W. Symon, Jr., Rep.	14,892
Sam B. Hill, Dem.	43,059

WEST VIRGINIA

U. S. Senator

Matthew M. Neely, Dem.	342,437
John MacDonald, Pro.	1,293
James Ellwood Jones, Rep.	209,427

U. S. Representatives

1. Carl G. Bachmann, Rep.	43,919
Robert L. Ramsay, Dem.	34,368
2. Frank L. Bowman, Rep.	36,079
Jennings Randolph, Dem.	34,968
3. Lynn S. Horner, Dem.	39,976
John M. Wolverton, Rep.	35,853
4. Robert L. Hogg, Rep. (long term)	43,152
R. L. Via, Dem. (long term)	42,677
Robert L. Hogg, Rep. (short term)	41,455
Mary M. Johnson, Dem. (short term)	35,649
5. Hugh Ike Shott, Rep.	44,978
T. J. Lilly,, Dem.	41,162
6. Joe L. Smith, Dem.	80,828
Fred O. Blue, Rep.	61,876

WISCONSIN

Governor

Phillip F. LaFollette, Rep.	392,958
Charles E. Hammersley, Dem.	170,020
Frank B. Metcalfe, Soc.	25,607
Alfred B. Taynton, Pro.	14,818
Fred Bassett Blair, Ind. Com.	2,998

U. S. Representatives

1. Henry Allen Cooper, Rep.	46,272
William C. Kiernan, Ind. Dem.	2,101
2. Charles A. Kading, Rep.	43,184
A. A. Nowak, Dem.	14,780
3. John M. Nelson, Rep.	43,184
Frank J. Antoine, Ind. Dem.	2,219
4. John C. Schafer, Rep.	26,763
W. F. Quick, Sr., Soc.	20,789
William J. Kershaw, Dem.	8,871
Jos. A. Hansen, Pro.	531
John Kasun, Ind. Com.	442
5. William H. Stafford, Rep.	27,533
James P. Sheehan, Soc.	26,357
Thomas O'Malley, Dem.	10,947
Raymond Hansborough, Ind. Com.	469

Unexpired Term

6. Michael K. Reilly, Dem.	25,400
Philip Lehner, Rep.	24,825
Leonard L. Gudex, Soc.	16
7. Gardner R. Withrow, Rep.	31,530
Merlin Hull, Rep.	5,606
Oliver Needham, Pro.	1,178
8. Gerald J. Boileau, Rep.	30,045
William F. Collins, Dem.	7,927
9. George J. Schneider, Rep.	43,080
10. James A. Frear, Rep.	36,804
Wesley Vasey, Pro.	940
11. Hubert H. Peavey, Rep.	43,004

WYOMING

Governor

F. C. Emerson, Rep.	38,058
Leslie A. Miller, Dem.	37,188

U. S. Senator

Robert D. Carey, Dem.,	
Long term	43,626
Short term	42,726
Harry H. Schwartz, Dem.,	
Long term	30,259
Short term	29,904

U. S. Representative

Vincent Carter, Rep.	44,890
John P. Rusk, Dem.	24,519

COGNATE SOCIETIES

GENERAL

American Antiquarian Society, Worcester, Mass.

American Baptist Historical Society, Upland Avenue, Chester, Pa.

American Irish Historical Society,

132 East 16th St., New York City.

American Historical Assn., 40 B Street S. W., Washington, D. C.

American Jewish Historical Society, 531 West 123rd Street, New York City.

American Numismatic Society, 156th Street at Broadway, New York City.

American Proportional Representation League, 1417 Locust Street, Philadelphia, Pa.

American Scenic and Historic Preservation Society, 154 Nassau Street, New York City.

American Society of Church History, 98 Mercer St., Princeton, N. J.

Canadian Historical Assn., Ottawa, Canada.

Hispanic Society of America, 156th St., W. of Broadway, New York City.

Holland Society of New York, 90 West Street, New York City.

Huguenot Historical Society of America, 2 West 45th Street, New York City.

Lincoln History Society, 30 Irving Place, New York City.

Methodist Historical Society, 150 Fifth Ave., New York City.

Mississippi Valley Historcal Assn., Austin, Tex.

National Historical Society, 33 West 97th St., New York City.

New England Historic Geneological Society, 9 Ashburton Place, Boston, Mass.

Northwestern Assn. of History, Government and Economic Teachers, Spokane, Wash.

Presbyterian Historical Society, 520 Witherspoon Building, Philadelphia, Pa.

Society for the Preservation of New England Antiquities, 2 Synde Street, Boston, Mass.

Steuben Society of America, 369 Lexington Ave., New York City.

Thomas Paine National Historical Assn., 50 West 47th Street, New York City.

United States Catholic Historical Society, New York City.

Woodrow Wilson Foundation, 17 East 42nd St., New York City.

POLITICAL

League for Independent Political Action, 52 Vanderbilt Ave., New York City.

League for Industrial Democracy, 70 Fifth Ave., New York City.

National Democratic Committee.

National League of Women Voters, 532 17th St. N. W., Washington, D. C.

National Municipal League, 261 Broadway, New York City.

National Republican Committee.

Women's National Democratic Club, Inc., Hotel Wellington, 235 West 102nd St., New York City.

Women's National Republican Club, 6 East 37th Street, New York City.

DIVISION II

INTERNATIONAL SITUATIONS AFFECTING THE UNITED STATES

THE UNITED STATES FOREIGN SERVICE

By Margaret deForest Hicks Williams

Writer and Specialist on International Affairs

ROGERS BILL REORGANIZATION

Services Merged.—A momentous and far-reaching change occurred in the status of the diplomatic and consular services of the United States when, on July 1, 1924, the so-called Rogers Bill became a law. By this Act, which was approved May 24, 1924, the former diplomatic and consular services were merged into one, to be known thenceforth as the United States Foreign Service. Prior to 1906, both the diplomatic and consular services were administered on a political basis. In that year the consular service was placed on a civil service basis, and three years later (1909) a similar status was accorded the diplomatic service also. There were, however, manifest improvements needed even after these two changes had been brought about, and it was to effect these improvements that the Rogers Bill was drafted and made a law. (For changes and purposes incidental to this legislation see The American Year Book for 1929).

FOREIGN SERVICE ADMINISTRATION

Regulations.—Of equal importance with the Rogers Act are the Administrative Regulations embodied in an Executive Order (No. 4022, June 7, 1924). These regulations give practical effect to all the chief purposes of the Act. They set up the machinery whereby it is put into operation by providing for a Foreign Service Personnel Board, an Executive Committee, a Board of Examiners, a Foreign Service School, and a Foreign Service School Board.

Foreign Service Personnel Board.—The duties of this board are to examine into the character, ability, efficiency, experience and general availability of all members of the Service with a view to promotion, transfers, the consideration of controversies or delinquencies, and the recommendation of those showing marked general ability to the rank of minister as vacancies arise. The board is composed of the Under-secretary of State, who is chairman, an Assistant Secretary of State, the Assistant Secretary of State formerly known as the Director of the Consular Service, and members of the Executive Committee of the Foreign Service Personnel Board.

The Executive Committee.—The duties of the Executive Committee of the Foreign Service Personnel Board are left to the discretion of the Secretary of State and are prescribed by him. The board is composed of a chairman and two members who are Foreign Service officers of high rank representing both the diplomatic and consular branches of the Foreign service. These three are selected by the members of the Personnel Board with the approval of the Secretary of State.

The Board of Examiners.—The duties of this board are to formulate rules for and hold examinations of applicants for commission to the Forign Service and to determine those ho are fitted for appointment, and he scope and method of examination hich shall be both written and oral nd open only to American citizens f good standing between the ages of 2 and 35 and designated by the resident for appointment subject to xamination. The board is composed f the Under-secretary of State, an ssistant Secretary of State to be esignated by the Secretary of State, he Assistant Secretary of State fornerly known as the Director of the onsular Service, the chairman of the xecutive Committee of the Foreign Service Personnel Board, and the hief Examiner of the Civil Service ommission or such persons as may e appointed by him to serve in his tead.

THE FOREIGN SERVICE SCHOOL

Purposes.—The purpose of this school is to provide a one year term of instruction in the Department of State as a period of probation for those successfully passing the examinations given by the Board of Examiners, and to judge, during this period, the new appointees to the Service, as to their qualifications for advancement and assignment to duty as a Foreign Service officer. The governance of the school is to be set forth in rules and regulations prescribed by the Secretary of State. The school is under the direction of the Foreign Service School Board.

The Foreign Service School Board.—The duties of this board are to act in all matters concerning the functions of the school with the approval of the Secretary of State; to select the chief instructor of the Foreign Service School from among the officers of the Foreign Service with the approval of the Secretary of State; and in its discretion to select other instructors from among the qualified officers of the Department of State, the Foreign Service, the executive departments of the Government, and other available sources, the board is composed of the Under-secretary of State, an Assistant Secretary of State to be designated by the Secretary of State, the Assistant Secretary of State formerly known as the Director of the Consular Service, the Chairman of the Executive Committee of the Foreign Service Personnel Board, and the chief instructors of the Foreign Service School.

FOREIGN SERVICE PERSONNEL

Changes.—During 1930, 268 persons took the written examinations for appointment to the United States Foreign Service. One hundred and sixty-two passed the written test and presented themselves for the oral. Sixty-three passed the oral test as well, and 62 were appointed to the Foreign Service. Sixteen women took the written examination, ten took the oral. One woman passed both tests and was appointed to the Service.

Promotion from Ranks.—Since 1925, when the policy was formulated of promoting outstanding officers of the Service to the grade of minister and ambassador instead of recruiting them from civil life alone, there have been marked advances. During 1930, twenty-two of the ministers and six of the ambassadors representing the United States in foreign countries had been drawn from the ranks of the Foreign Service. And in addition, both the Minister Resident and Consul General at Ethiopia, and the Diplomatic Agent and Consul General at Tangier, Morocco, were Foreign Service officers.

Losses to the Service.—During 1930 there have been six deaths, five retirements, and twenty-eight resignations from the Foreign Service. The number of resignations is more than a third less than that for the corresponding period in 1929. In most cases the cause of resignation was the small salaries which still, even with the passage of the Rogers Act, attach to the positions of the Service. It continues to be a practical impossibility for a man to occupy any of the higher ranks in the Service and maintain his position on his salary alone, a deplorable fact which obviously needs a remedy by Congressional action. At present the Service totals 694 persons.

RECLASSIFICATION

The practical results of the putting into effect of the provisions of the Rogers Act and Executive Order No. 4022 may be seen from the following table which shows the reclassification from the old to the new status with salaries:

Former Classifications	Former Salary	New Classification as Foreign Service Officer	New Salary	No. in Grade, end of 1930
Secretary, Class One (Counselor of Emb.)	$ 4,000	Class One	$9,000	26
Consul General, Class One	12,000	Class One	9,000	
Consul General, Class Two	8,000	Class One	9,000	
Secretary, Class One (Counselor of Leg.)	4,000	Class Two	8,000	39
Consul General, Class Three	6,000	Class Two	8,000	
Secretary, Class One	4,000	Class Three	7,000	45
Consul General, Class Four	5,000	Class Three	7,000	
Consul General at Large	5,000	....	5,000	
Secretary, Class Two	3,600	Class Four	6,000	56
Consul General, Class Five	4,500	Class Four	6,000	
Consul, Class One	8,000*	Class Four	6,000	
Consul, Class Two	6,000	Class Four	6,000	
Consul, Class Three	5,000	Class Four	6,000	
Chinese Secretary	5,500	Class Four	6,000	
Japanese Secretary	5,500	Class Four	6,000	
Turkish Secretary	5,500	Class Four	6,000	
Consul, Class Four	4,500	Class Five	5,000	65
Secretary, Class Three	3,000	Class Six	4,500	85
Consul, Class Five	4,000	Class Six	4,500	
Chinese Asst. Secretary	4,000	Class Six	4,500	
Japanese Asst. Secretary	4,000	Class Six	4,500	
Turkish Asst. Secretary	4,000	Class Six	4,500	
Consul, Class Six	3,500	Class Seven	4,000	78
Secretary, Class Four	2,500	Class Eight	3,500	91
Consul, Class Seven	3,000	Class Eight	3,500	
Consul, Class Eight	2,500	Unclassified	3,000	209
Consul, Class Nine	2,000	Unclassified	3,000	
Vice-Consul of Career	2,500	Unclassified	2,750	
	2,750	Unclassified	2,750	
Consular Assistants	1,500	Unclassified	2,750	
	2,500	Unclassified	2,750	
Interpreters	2,000	Unclassified	2,750	
Student Interpreters	1,500	Unclassified	2,750	

* Sect. 8 of the Rogers Act provides "that Consuls General of Class One, and Consuls of Class One, holding office at the time this Act takes effect shall not, as a result of their recommissioning or reclassification suffer a reduction in salary below that which they were then receiving."

DIPLOMATIC PERSONNEL

AMBASSADORS

ACCREDITED BY UNITED STATES			ACCREDITED TO UNITED STATES	
Country	Appointed		Commissioned	
Argentina	Robert Woods Bliss	1927	Señor Don Julian Enciso (Chargé d'Affaires A.I.)	1929
Belgium	Hugh S. Gibson	1927	H.H. Prince Albert de Ligne	1927
Brazil	Edwin V. Morgan	1912	Mr. S. Gurgél do Amaral	1925
Chile	William S. Culbertson	1928	Señor Don Carlos G. Dávila	1927
Cuba	Harry F. Guggenheim	1929	Señor Don Orestes Ferrara	1926
France	Walter E. Edge	1929	M. Paul Claudel	1927
Germany	Frederic M. Sackett	1930	Herr Frederich W. von Prittwitz	1928
Great Britain	Charles G. Dawes	1929	The Hon. Sir Ronald Lindsay	1930
Italy	John W. Garrett	1929	Nobile Giacomo de Martino	1925
Japan	W. Cameron Forbes	1930	Mr. Katsuji Debuchi	1928
Mexico	Ruben Clark	1930	Señor Don Manuel C. Téllez	1925

AMBASSADORS (Continued)

ACCREDITED BY UNITED STATES			ACCREDITED TO UNITED STATES	
Country	Appointed		Commissioned	
Peru	Fred Morris Dearing	1930	Señor Don Manuel de Freyre y Santander	1930
Poland	John N. Willys	1930	Mr. Tytus Filipowicz	1929
Russia	....		Mr. Serge Ughet, Financial Attaché, New York	
Spain	Irwin B. Laughlin	1929	Señor Don Alejandro Padilla y Bell	1926
Turkey	Joseph C. Grew	1927	Ahmet Mouhtar Bey	1927
Union of Soviet Socialist Republics	(No Diplomatic Relations)		(No Diplomatic Relations)	

MINISTERS

ACCREDITED BY UNITED STATES			ACCREDITED TO UNITED STATES	
Country	Appointed		Commissioned	
Albania	Herman Bernstein	1930	Mr. Faik Konitza	1927
Austria	Gilchrist Baker Stockton	1930	Mr. Edgar L. G. Prochnik	1925
Bolivia	Edward F. Feely	1930	Señor Don Eduardo Diez de Medina	1928
Bulgaria	Henry Wharton Shoemaker	1930	Mr. Simeon Radeff	1925
Canada	Hanford MacNider	1930	The Hon. Vincent Massey	1927
China	Nelson Trusler Johnson	1929	Mr. Chao-Chu Wu	1929
Colombia	Jefferson Caffery	1928	Señor Dr. José M. Coronado (1st Sec. Leg Chargé d'Affaires A.I.)	
Costa Rica	Charles C. Eberhardt	1930	Señor Don Manuel Castro Quesada	1928
Czechoslovakia	Abraham C. Ratchesky	1930	Mr. Ferdinand Veverka	1928
Danzig, Free City of	C. Warwick Perkins, Jr. (Consul, in charge)	1929	....	
Denmark	Ralph Herman Booth	1930	Mr. Constantin Brun	1912
Dominican Republic	Charles B. Curtis	1929	Señor Rafael Brache	1930
Ecuador	William Dawson	1930	Señor Dr. Don Homero Viteri Lafronte	1929
Egypt	William M. Jardine	1930	Aly Ismail Bey	1930
El Salvador	Warren D. Robbins	1928	Señor Dr. Don Francisco A. Lima	1927
Estonia	Frederick W. B. Coleman	1922	Col. Victor Mutt, Con.-Gen. in N. Y. in charge of Legation	1927
Ethiopia	A. E. Southard	1927	....	
Finland	Edward E. Brodie	1930	Mr. Axel Leonard Aström	1922
Greece	Robert P. Skinner	1926	Mr. Charalambos Simopoulos	1924
Guatemala	Sheldon Whitehouse	1929	Señor Dr. Don Adrian Recinos	1930
Haiti	Dana G. Munro	1930	Mr. Ulrich Duvivier	1930
Honduras	Juilus G. Lay	1929	Señor Dr. Don Ernesto Argueta	1929
Hungary	Nicholas Roosevelt	1930	Count Lászlo Széchényi	1922
Iraq	Alexander K. Sloan (Consul, in charge)	1930	....	
Irish Free State	Frederick A. Sterling	1927	Mr. Michael MacWhite	1929
Latvia	Frederick W. B. Coleman	1922	Mr. Arthur B. Lule (Con.-General, N. Y.)	1927
Liberia	Charles E. Mitchell	1930	....	
Lithuania	Frederick W. B. Coleman	1922	Mr. Bronius Kasimir Balutis	1928
Luxemburg	Hugh S. Gibson	1927	Baron Raymond de Waha (Chargé d'Affaires)	1920
Monaco	Robertson Honey (Consul in charge)	1929	....	
Morocco	Maxwell Blake (Diplomatic Agent)	1927	....	

MINISTERS (Continued)

ACCREDITED BY UNITED STATES			ACCREDITED TO UNITED STATES	
Country	Appointed		Commissioned	
Netherlands	Gerrit John Diekema	1929	Mr. J. H. van Royen	1927
Nicaragua	Matthew E. Hanna	1929	Señor Dr. Don Juan B. Sacasa	1929
Norway	Hoffman Philip	1930	Mr. Halvard H. Bachke	1929
Palestine	Paul Knabenshue (Con. General in charge)	1928	....	
Panama	Roy T. Davis	1929	Señor Dr. Don Ricardo J. Alfaro	1922
Paraguay	Post Wheeler	1929	Señor Don Pablo M. Ynsfran (Sec. Leg. in charge)	1929
Persia	Charles C. Hart	1929	Mirza Davoud Khan Meftah	1926
Portugal	John Glover South	1929	Viscount d'Alte	1902
Rumania	Charles S. Wilson	1928	Mr. Charles A. Davila	1929
San Marino	Joseph E. Haven (Consul in charge)	1925	....	
Serbs, Croates and Slovenes, Kingdom of	John Dyneley Prince	1926	Dr. Leonide Pitamic	1929
Siam	David E. Kaufman	1930	Maj. Gen. Prince Amoradat Kridatkara	1929
Sweden	John Motley Morehead	1930	Mr. W. Boström	1926
Switzerland	Hugh R. Wilson	1927	Mr. Marc Peter	1920
Syria	Herbert S. Gould	1930	....	
Union of South Africa	Ralph J. Totten	1930	Mr. Eric Hendrik Louw	1929
Uruguay	J. Butler Wright	1930	Dr. J. Varela	1920
Venezuela	George T. Summerlin	1929	Señor Dr. Don Pedro Manuel Arcaya	1929

UNITED STATES TREATIES

BY DENYS P. MYERS

DIRECTOR OF RESEARCH, WORLD PEACE FOUNDATION

GENERAL

Some 30 treaties and a third as many executive agreements of treaty character entered into force for the United States in 1930. In addition 15 more were signed during the year but did not get into force, while as many more, left over from the past, were awaiting the advice and consent of the Senate. Further, half a dozen conventions of multilateral character had either not been transmitted to the Senate or had not yet been subscribed to on behalf of the President, following participation by the United States in the conferences which had produced them.

LONDON NAVAL TREATY

Not included in the above summary is the best known of the year's work, the London naval treaty of April 22, for which the members of the British Commonwealth of Nations (except the Irish Free State), Japan and the United States deposited ratifications at a world-wide broadcasting ceremony on Oct. 27. The Irish Free State did not complete its ratification for deposit until December, when all five parts of the treaty came into force for the British Empire, Japan and the United States. Part III of the treaty relates to the limitation of cruiser and submarine tonnage, on which France and Italy could not agree at the conference; the other four parts were subscribed to by them and may be separately ratified; while, if they agree on tonnage, the adjourned conference will reconvene in some manner to effect their participation in the whole treaty. That was the most complicated and attention-arresting treaty in which the United States concerned itself during the year, though it is only a part of a continuing negotiation to curb all armament. Its existence enabled the Preparatory Commission for the Disarmament Conference to proceed, after three years of delay, and in November to complete its draft convention on the entire subject.

FOREIGN TRADE CONVENTION

Another complicated field of international relations became real for the United States by the proclamation on March 6 of the convention, protocol, supplementary agreement and supplementary protocol on the abolition of import and export prohibitions and restrictions. The primary convention and protocol were agreed to in conference Nov. 8, 1927, but not signed for Washington until Jan. 30, 1928. The ratification of the United States was deposited within the stipulated time in September, 1929, but the requisite number of parties had not been obtained and a third conference—the convention required two—was necessary in December, 1929, to arrange its entry into force until January 1, 1935. In the meantime the United States is observing rather than participating in the developments facilitating international trade proceeding on the foundation of the convention.

COMMERCIAL TREATIES

Salvador and Turkey.—Revision of the commercial treaty structure of the country goes on steadily, as befits a country in the forefront of activity whose controlling engagements are old-fashioned. The treaty of friendship, commerce and consular rights with Salvador, signed Feb. 22, 1926, came into force Sept. 5, 1930, superseding a predecessor of 1870. Finally recognition of Turkey's new position has been given. The "equal" treaty made in 1924 at Lausanne failed on account of sentimental opposition in the Senate and elsewhere. A short treaty of commerce and navigation was signed at Ankara Oct. 1, 1929, and came into force April 22, 1930. It deals only with essentials, but serves to wipe out extraterritoriality.

"Most-Favored-Nation" Treatment.—Closely associated with international commercial relations is the incidence of the most-favored-nation clause. This clause can be applied in a surprising number of ways, but essentially it raises the question whether concessions of duties are to be granted for special favors or whether the same duties will apply to the products of all countries. The customs tariff of the United States is a legislative creation, and is relatively rigid. Other states in their primary legislative tariffs specify different forms of treatment, so that a more favorable series of rates can be negotiated with a given country if the *quid pro quo* is satisfactory. In a series of exchange of notes the United States has for several years been reaching agreements for "unconditional most-favored-nation" treatment with those countries that could be induced to assent. The 1930 exchanges to that end were with Egypt on May 24 and with Rumania on August 20. The same principle appears in the two commercial treaties, as it has in previous ones. Acceptance of the principle as interpreted by the United States is the issue which delays a complete revision of pre-war commercial treaties, and the difference in theory may in the future result in a genuine and public conflict of views. The present treaty structure includes the acceptance of the American interpretation by almost all the other countries able or willing to apply it.

Income Tax On Shipping.—Another question of a commercial character which is on the way to stabilization is the relief of nationals from double income tax on shipping profits. Arrangements effected by exchange of notes on this matter were effected in 1930 with the Dominion of Canada, Aug. 2 and Sept. 17; with Great Britain and Northern Ireland, in 1924 and 1925 but only formally published in 1930; with Japan in 1926 and similarly published; and with Spain April 16 and June 30. The principle of the arrangements, authority for which is derived from the Revenue Acts, has the effect of making the profits of shipping corporations, even if made within the other jurisdiction, subject only to income tax in the home country.

WORLD COURT

On Dec. 10 the President took another step in the long drawn out process of adherence to the Permanent Court of International Justice. He submitted to the Senate for its advice and consent to ratification the three protocols which were signed Dec. 9, 1929. The Statute of the Court is a document which stands remarkably by itself, in obedience to the international instinct for an independent judiciary. It is not itself a treaty but, as it were, just exists. Yet it had to emanate from somewhere, and the states brought it into existence by covering it with a protocol of signature dated Dec. 16, 1920. The Statute has been revised after one judicial term of experience, and the revision protocol was opened Sept. 14, 1929. On the same day the third protocol was opened to provide practical methods for carrying out the reservations stipulated by the United States as a condition of its joining this world judicial system. The President had all three signed a year ago and this year asked the Senate to reach a decision concerning them.

ARBITRATION AND CONCILIATION TREATIES

During 1930 the pacific settlement policy of the country pursued its bilateral course. This policy consists of negotiating an arbitration treaty of limited scope and a conciliation treaty covering all other questions with each non-American state. The policy dates from 1928 and during 1930 such pairs of treaties came into force with Belgium, Estonia, Latvia, Lithuania, Luxemburg and Poland. The pair with the Netherlands was completed by the consummation of an improved arbitration treaty, and the nascently autonomous position of Iceland was recognized by the separate completion of such a treaty with it. The policy is realized with respect to 24 countries, in course of realization with several others and partially in effect for still more. Both bilateral and multilateral engagements are in force with many American states.

PAN-AMERICAN POLITICAL TREATIES

Two samples of Pan-American "codification" came into force for the United States during the year. The convention of Habana on the status of aliens applies with Brazil, Nicaragua and Panama some seven principles that should serve somewhat to clarify the rights of the respective states toward foreigners. The United States by reservation retains a claim to obliging aliens to perform military service, but only in case of war. The other Habana convention relates to the duties and rights of states in the event of civil strife and is in force between the United States, Brazil, Mexico, Nicaragua and Panama. It deals primarily with the possibility of one state being the base of operations or the point of departure for rebel forces or insurgent vessels. The provisions of neither go very far, but they represent a sound beginning of the more orderly treatment of political disorder.

MISCELLANEOUS TREATIES

Among the other treaties coming into force were the debt-funding agreement with France and the one of June 13 with Germany, on both of which the bonds have been delivered. An agreement with Belgium for the erection of memorials in that country by the American Battle Monuments Commission and a convention with Mexico safeguarding livestock interests through the prevention of infectious and contagious diseases demonstrate the wide range of modern treaty arrangements.

TREATY POLICY AND PROCEDURE

Public Information. — Possibly more significant than any treaties made during 1930 was the practice adopted by the Department of State of making information concerning the entire treaty structure generally available. Hitherto no phase of governmental business has been more closely guarded and popularly considered as less mysterious. But somewhat over a year ago the Treaty Division began publishing monthly a *Treaty Information Bulletin*, which enables any subscriber to follow the development of the national policy. There are reported the signing, the circumstances of negotiation, the ratifications and many times the texts of all the treaties. Even more useful, because ordinarily less available, changes of status of multilateral treaties to which the United States is a party or in which it is interested, are recorded. In the long run all this information made promptly public will insure a desirable familiarity with the permanent features of foreign policy.

Executive Agreement Arrangements.—Another innovation was the beginning of the *Executive Agreement Series* in addition to the *Treaty Series*, separate pamphlets published since 1905. Congress tends more and more to lay down policies having foreign angles. When these are the subject of arrangements with other countries, there is no need for the advice and consent of the Senate since it has already been given. Usually the form is an exchange of notes, of treaty character but not of formal, or at least constitutional, treaty status. The practice of publishing such arrangements in a separate series makes them readily available and emphasizes a proper distinction. For the first time the Government is now committing itself to recording all the arrangements which involve formal undertakings with other nations.

THE LONDON NAVAL CONFERENCE

By John M. Mathews

Professor, University of Illinois

GENERAL

A conference on the limitation of armaments was held in Washington in 1921-22, but was only partially successful, in that, while it was able to secure agreement on the limitation of battleships and aircraft carriers, it left the powers free to construct without limit other types of warships. Another conference on the limitation of armaments was held at Geneva in 1927 but was a total failure, largely because it was dominated by the naval experts. The Preparatory Commission on Disarmament of the League of Nations, on which the United States is represented, has been holding periodical meetings, but without accomplishing much. Preliminary conversations between Premier MacDonald of England and President Hoover were held at the mountain camp on the Rapidan in the fall of 1929 and, as a result, Premier MacDonald issued invitations to the four other principal naval powers—United States, Japan, France, and Italy—to send representatives to meet with those of England at a conference in London. The conference convened in January, 1930, and remained in session until the latter part of April. The delegates from the United States were Secretary of State Stimson, Ambassadors Morrow, Dawes and Gibson, Senators Reed and Robinson, and Secretary of the Navy Adams.

PURPOSES AND RESULTS

Cruiser Limitation.—One of the principal purposes of the Conference was to secure an agreement on the limitation of the types of warships other than those which had been limited at the Washington Conference. In this connection, one of the principal difficulties was in securing a limitation agreement regarding cruisers, in respect to which the United States desired substantial parity with Great Britain. On account of the distance between her naval bases, the United States desired cruisers of large tonnage and heavy guns, while Great Britain preferred a larger number of smaller cruisers. As between these two powers, it was finally decided that the United States might have 323,500 tons to 339,000 for Great Britain. The United States, however, is allowed to build cruisers up to 10,000 tons each, and a larger pro-

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portion of its cruiser tonnage than in the case of Great Britain may carry guns of a larger calibre than six inches.

The Battleship Ratio.—The Washington Conference had, in the case of battleships, established a ratio of 5-5-3 between Great Britain, the United States, and Japan. Before the London Conference, however, Japan had indicated her desire to increase this ratio to 70 per cent in cruisers and destroyers. She defended this demand on the ground that it could not be used for offensive purposes. It was finally decided to allow her the 70 per cent ratio in the case of destroyers and small cruisers. In the case of the larger cruisers, she was technically placed on a 60 per cent ratio; but, in view of the understanding that the United States would not complete the building of more than fifteen cruisers of this class before 1936, Japan is really placed on a 70 per cent basis with the United States.

Destroyers.—The three major naval powers experienced little difficulty in arriving at an agreement for the limitation of destroyers. It was agreed that the United States and Great Britain should each have 150,000 tons of this type of ship, while Japan was accorded 105,450 tons.

Submarines.—Some suggestion was made at the London Conference for the abolition of the submarine, and this suggestion was favored by the delegates of the United States, provided all the powers would agree. Such an agreement, however, could not be reached, and, in the end, the three principal naval powers were each allowed 52,700 tons of submarines. In this connection, an attempt was made to humanize submarine warfare by restricting the use of this type of ship in attacks on merchant ships. The rules of international law as applied to surface vessels were extended to submarines. So long as the submarine is allowed, however, it is doubtful whether such rules will be strictly observed in time of war.

BATTLESHIP "HOLIDAY"

The battleship is the most expensive type of warship and is regarded by some naval experts as of little use under the conditions of modern warfare. Some suggestion was made at the London Conference for the abolition of the battleship, but this suggestion was not favored by the American delegation. The Conference, however, succeeded in reaching an agreement, adhered to by all five powers, for a battleship "holiday." The Washington Conference had allowed the replacement, beginning in 1931, of those battleships reaching the age limit of twenty years. Between that year and 1936 the cost to the three principal naval powers for replacement of battleships would probably run to upwards of $700,000,000. At the London Conference, the five powers agreed to a revision of the Washington treaty so as to suspend the replacement program and to build no new battleships until 1936. In addition, the three principal naval powers agreed to dispose of nine battleships within two and a half years after the treaty goes into effect.

THE POLITICAL PHASES

Franco-Italian Impasse.—The London Conference did not deal merely with ships and guns, but was also concerned with important political questions. Although Premier MacDonald conducted preliminary negotiations with the United States, he apparently failed to do so in the cases of France and Italy and thus possibly wounded the *amour propre* of those countries. Italy demanded parity with France, which the latter was unwilling to grant. The controversy over parity between these two powers came near wrecking the proceedings of the conference. Although the United States, Great Britain, and Japan have ratified the treaty drawn up at London, France and Italy have failed to compose their differences and have therefore not ratified. For practical purposes, therefore, the London treaty may be regarded as a three-power, rather than a five-power, agreement.

U. S. Rejection of Consultative Pact.—The traditional position of

France has been that security should precede, rather than follow, disarmament. This thesis she supported vigorously at the London Conference. Before agreeing to limitation of armament, she demanded an agreement of mutual assistance which would increase her security. This might take the form of a clarification of Article XVI of the Covenant of the League of Nations whereby unanimous recommendations of the League Council should be regarded as obligatory. This, however, would not apply to the United States, a non-member of the League. The United States is, however, a signer of the Kellogg pact. At the time of the Russo-Chinese crisis in November, 1929, the United States Government had felt the need of implementing the Kellogg pact at least to the extent of consulting with the other powers. Moreover, in the Four-Power Pacific Treaty, the United States had agreed to consult with the other signatory powers when the *status quo* in the Pacific should be threatened. It was therefore suggested that the United States should agree to a consultative pact as a part of the London naval treaty. There was wide difference in the United States as to whether our Government should enter into such a pact. Our delegation at London finally declined definitely to do so. The reason for this position was indicated in a public statement of Secretary Stimson in which he said that the United States will not "enter into any treaty, whether consultative or otherwise, where there is danger of its obligation being misunderstood as involving a promise to render military assistance or guaranteeing protection by military force to another nation. Such a misunderstanding might arise if the United States entered into such a treaty as a *quid pro quo* for the reduction of the naval forces of another power."

The Escalator Clause.—A clause in the London treaty, inserted at the insistence of Great Britain, and variously known as the escalator, escape, or safeguarding clause, has aroused much discussion. It permits any one of the three principal naval powers to override the limitations of the treaty and to increase its naval tonnage if, in its opinion, its national security should be affected by new construction of any other power. Its release from the obligations of the treaty may, under these circumstances be secured by merely notifying the other contracting parties to that effect. The latter are thereupon similarly released from the limitations of the treaty. There has been considerable difference of opinion regarding the effect of this clause. Some hold that it is likely to nullify the entire achievements of the treaty, while others hold that it may practically be disregarded because it is not likely to be invoked. Only time can tell which of these views is more nearly correct. It may be noted, however, that if Great Britain continues to hold to the double or two-power standard, *i.e.*, that her navy should be as strong as those of any two Continental European powers, the possibility that the clause may be invoked does not seem to be altogether remote.

U. S. RATIFICATION OF NAVAL TREATY

The impression created by the London Naval Treaty in the United States was generally one of distinct disappointment in that it had not achieved nearly as much as the American public had hoped for and had been led to expect. Nevertheless, there was also a general feeling that it was best to accept it on the ground that a half-loaf is better than none. The results of the conference were signalized by President Hoover in an optimistic statement in which he declared that "the most vital feature of its great accomplishments for peace is the final abolition of competition in naval arms between the greatest naval powers and the burial of the fears and suspicions which have been the constant product of rival warship construction."

On May 1 the President sent the official copy of the treaty to the Senate for its approval. That body, however, failed to act upon the treaty at the regular session. Consequently, in July the President called a special session of the Senate for its consideration. In his message recommending approval of the treaty, the President declared that "the only alternative to this treaty is the competitive building of navies, with all its flow of suspicion, hate, ill-will, and ultimate disaster."

A small minority of senators raised various objections to the treaty, among them being the provision regarding cruisers, the escalator clause, and the concessions made to Japan. They demanded that all secret documents drawn up in connection with the treaty should be sent to the Senate for its examination. President Hoover declined to accede to this demand. They suggested various reservations which should be attached to the treaty. None of these was adopted, however, except a comparatively harmless one suggested by Senator Norris of Nebraska, providing that there should be no secret commitments, modifying the treaty. Finally, on July 21, after two weeks of debate, the Senate gave its approval of the treaty by a vote of 58 to 9. In signing the treaty on the following day, President Hoover declared that the treaty "will translate an emotion deep in the hearts of millions of men and women into a political fact of government and international relations. It will renew again the faith of the world in the moral forces of good-will and patient negotiation as against the blind forces of suspicion and competitive armament."

THE UNITED STATES AND WORLD AFFAIRS

By John M. Mathews

Professor, University of Illinois

ALLIED DEBTS AND GERMAN REPARATIONS

Young Plan.—The year 1930 has been no less significant than previous years in revealing the extent to which the United States is concerned in world affairs and to which isolation is an impossible condition. Our participation in world affairs has been partly official and partly unofficial. As examples of the latter may be mentioned the part taken by Owen D. Young, chairman of the board of the General Electric Company, in the formulation of the Young Plan, to take the place of the Dawes Plan in regulating German reparations. As part of the Young Plan, an international bank has been established at Basle, Switzerland, with Gates W. McGarrah as its president. The United States Government declines to admit that there is any legal connection between German reparations and the allied debts. There is, however, undoubtedly a close economic connection, and this explains our interest in placing the problem of German reparations on a stable basis. The Young Plan involved the flotation of a large German loan, of which $90,000,000 was floated in the United States. These bonds were originally brought out at 90 in this country, but, largely as a result of the German elections, they have fallen considerably below that figure.

Tariff and Debt Payments.—Although our Government continues officially to expect the repayment of the allied debts in accordance with the funding agreements, Congress, through the passage of the Smoot-Hawley tariff law containing increased rates, is making the repayment more difficult. There have been unofficial foreign criticisms of our high tariff. Foreign governments, however, have no right to make official protest against it, as the regulation of the tariff is a domestic matter. They can, however, retaliate in kind, and thus affect the American export trade, upon which our economic prosperity to some extent depends.

THE UNITED STATES AND THE LEAGUE OF NATIONS

American Coöperation.—As in previous years, the United States, while avoiding political commitments in connection with the League, has continued to coöperate in its technical and humanitarian activities. This coöperation is sometimes unofficial, but is becoming more frequently official in character. Several Americans are members of the League secretariat. During the year under the auspices of the League a number of conferences and meetings of commissions were held with Americans in attendance. Among these was the meeting of the opium advisory committee in January at which the United States was represented by a member of the Far Eastern Division of the State Department. An American observer attended the conference on concerted economic action in February. In March the League conference on the codification of international law met at The Hague, with a distinguished American delegation in attendance. The subjects considered were nationality, territorial waters and responsibility of states for injuries done in their territory to persons or property of aliens. The conference succeeded only in drafting a convention dealing with nationality, but the latter was unsatisfactory to the American delegation on the ground that it did not sufficiently recognize the complete right of expatriation.

League Meetings.—At the conference held at Geneva in May on the unification of legislation dealing with bills of exchange, promissory notes and checks, our Government was represented by the United States Trade Commissioner at London. The United States was also represented at the meeting held in August of the special League committee on the traffic in women and children, and on the League financial committee which met in September. In November, the preparatory disarmament commission of the League met in Geneva, with 31 states in attendance, including two non-members—United States and Soviet Russia. The American delegation was headed by Ambassador Hugh Gibson. The commission encountered many difficulties in reaching agreement, and it does not seem likely that the general conference for which the commission is preparing will meet until 1932.

U. S. Consulate at Geneva.—Although the United States has no official representative at the League of Nations, it maintains a consulate at Geneva. Recently this consulate has been moved to new quarters nearer to the secretariat building of the League. Moreover, Prentiss Gilbert, an experienced official and formerly assistant chief of the Division of Western European Affairs of the State Department, has been appointed consul at Geneva. These changes seem to indicate increased interest in the League on the part of our Government.

THE UNITED STATES AND THE WORLD COURT

The Election of Judges.—Since its organization, the World Court has always had among its judges a citizen of the United States. At the beginning of the year, this representative was Charles Evans Hughes, but upon his appointment as Chief Justice of the United States, he resigned. He also withdrew from the panel of the Permanent Court of Arbitration, and in his place President Hoover appointed Roland W. Boyden of Boston. Since the establishment of the World Court, practically no cases are brought before the Permanent Court of Arbitration, so that almost its sole function is the nomination of candidates for election to the World Court. The election is made by the council and assembly of the League of Nations, and this year an entire panel of judges was elected in September. The American group of the Permanent Court, consisting of Mr. Boyden, Newton D. Baker, Elihu Root, and John Bassett Moore, nominated Frank B. Kellogg both to fill Mr. Hughes' unexpired term and also to serve for the full term of nine years from Jan. 1, 1931. Mr. Kellogg was also nominated by the Danish group of the Permanent Court. In September, Mr. Kellogg was duly elected for both of these terms by a majority of the Council and Assembly of the League, voting separately.

Movement Toward American Adherence.—As pointed out in THE AMERICAN YEAR BOOK for 1929 (p. 34), the so-called Root formula was drafted for the purpose of overcoming the impasse resulting from the Senate's fifth reservation to the World Court protocol, relating to advisory opinions. This formula is known officially as the "protocol for the accession of the United States to the protocol of signature of the Statute of the Permanent Court of International Justice." The Root formula met with the approval of President Hoover and Secretary of State Stimson, and at the direction of the President, our charge d'affaires at Berne signed the protocol at Geneva Dec. 9, 1929. During 1930 about thirty states ratified the protocol, and nothing remained to effect American entrance into the Court except the approval of the Senate. In his annual message to Congress at the opening of its session in December, President Hoover announced his intention, in a later special message, to "lay before the Senate the protocols covering the statutes of the World Court which have been revised to accord with the sense of previous Senate reservations."

Statute Revision.—In addition to the protocol for American accession to the Court, the United States has also signed the protocol of revision of the statute of the Court. A rule adopted by the Court had prohibited the giving of advisory opinions without the consent of the parties to the controversy. The protocol of revision embodies this rule in the statute, thus making it binding upon the Court. This protocol has been ratified by more than thirty states. In September Cuba raised objections to the protocol of revision, but these were later modified. The optional clause for compulsory jurisdiction of the World Court has been ratified by about thirty-five states, including most of the world powers.

THE KELLOGG PACT

The principal development during the year affecting the Pact was the movement to harmonize it with the League Covenant. A committee of eleven was appointed by the League Council to examine this question. It is not generally considered that the two documents are fundamentally antagonistic, but rather complementary. The Covenant recognizes war as an instrument of international policy, but this is not prohibited by the Pact. Nevertheless, it was thought that certain changes in the League Covenant would bring it more in harmony with the spirit of the Pact. The principal change recommended by the Committee of Eleven relates to the first paragraph of Article 12 of the Covenant, which would be amended so as to prohibit war altogether. No final decision regarding this project was reached during 1930.

THE UNITED STATES AND LATIN AMERICA

Haiti.—In view of various criticisms of our policy in Haiti, President Hoover in February appointed a commission, headed by W. Cameron Forbes, former Governor-General of the Philippines, to visit that country and to study the problem of American military occupation. Congress appropriated $50,000 for the expenses of the commission. In March the commission made its report which was accepted by President Hoover. In accordance with its recommendations, an election was held and a new government established. Furthermore, the American high commissioner was replaced by a diplomatic officer of ministerial rank. Finally, the gradual withdrawal of American marines was begun, and it is expected that complete retirement will be effected at the expiration of the present treaty in 1935.

Mexico.—Upon the resignation of Ambassador Morrow, J. Reuben Clark of Utah, former Under-secretary of State, was appointed to take his place as our diplomatic representative to Mexico. Mr. Clark is the author of a recently published memorandum on the Monroe Doctrine in which he declared that the Doctrine was meant to apply solely to relationships between European and American governments and that it "lays down no principles to govern the inter-relationships of the states of the Western Hemisphere as among ourselves."

When the immigration act was passed by Congress in 1924, Mexico, along with the other countries of the Western Hemisphere, was not placed under the quota system. The question of the extent of Mexican immigration to the United States has been much debated. In view of depression and unemployment in this country, a very considerable reduction was effected in 1930. This was brought about through our Government's refusal of visas to applicants likely to become public charges, as well as to contract laborers, illiterates and defectives.

In August the Mexican-United States Boundary Commission, created to rectify the course of the Rio Grande from El Paso to Fort Quitman, made its report recommending the straightening of the river between these points. It recommended that 88 per cent of the cost of this improvement should be borne by the United States. The report was approved by President Hoover, who instructed our ambassador at Mexico City to negotiate an agreement to render effective the commission's recommendations.

Nicaragua.—As in 1928, so again in 1930, the congressional elections in Nicaragua were supervised, at the request of the Nicaraguan Government, by representatives of the United States Government. Capt. Alfred Johnson of the U. S. Navy acted as chairman of the national electoral board, with broad powers over both registration of voters and the elections. Several hundred picked men from the U. S. Navy acted as members of the American electoral supervisory mission. The elections, which occurred Nov. 2, were reported to have been quiet and to have resulted in a victory for the Liberals. American marines still remain in Nicaragua for police duty against the bandits, who have not been entirely suppressed. The policy of our Government, however, is to place responsibility for maintaining order upon the native constabulary, over whom our marines act as officers. The United States Navy has been coöperating with the Nicaraguan Government in locating a seaport on the Gulf of Fonseca.

Cuba.—Under the Platt Amendment of 1901, which is embodied both in the Cuban Constitution as well as in a treaty between the United States and Cuba, the United States has the right to intervene in Cuba in order to restore peace and order. Although this right of intervention has been exercised but once (1906) situations have arisen on several occasions in which intervention was threatened. In the fall of 1930, an unusual condition of unrest led to reports that our Government was considering intervention. It would seem, however, that Washington, while maintaining a close watch on the situation, had no intention of intervening in such a way as to intermeddle in Cuba's internal affairs.

South America.—World-wide economic depression and general unrest led to the overthrow of several governments in South America, including Argentina, Brazil, Peru, and Bolivia. The governments newly established in those countries were promptly recognized by the United States upon evidence that they were able to give protection to our citizens and their property, and that they recognized their international obligations. In these instances, our Government departed somewhat from the policy which it has sometimes pursued of not recognizing revolutionary governments even when they give evidence of stability.

UNITED STATES RELATIONS WITH CHINA

New Minister.—Upon the resignation of John V. A. MacMurray as American Minister to China, Nelson Johnson, of the Far Eastern Division of the State Department, was appointed. On account of unsettled conditions, the U. S. Government found it necessary to maintain increased forces in China—gunboats, destroyers, and marines.

Extraterritoriality.—One of the principal diplomatic questions outstanding between the United States and China during 1930 was that relating to the right of extraterritoriality. On Dec. 28, 1929, the Nationalist Government issued a mandate declaring that "for the purpose of restoring her inherent jurisdictional sovereignty, it is hereby decided and declared that on and after [Jan. 1, 1930] all foreign nationals in the territory of China who are now enjoying extraterritorial privileges shall abide by the laws, ordinances, and regulations duly promulgated by the central and local governments of China." This declaration appeared on its face to be an attempt on the part of the Chinese Government to terminate by unilateral action the treaties on which the right of extraterritoriality is based. Further consideration, however, showed that this move was merely an attempt to hasten diplomatic conversations with the powers looking toward the termination of the right. The United States and Great Britain let it be understood that they were willing to consider Jan. 1, 1930, as the date from which the process of gradual abolition of extraterritoriality should be regarded as having commenced in principle. It was not expected, however, that actual abolition of consular jurisdiction would take place except by gradual stages. In September it was announced by the State Department at Washington that draft proposals for an agreement for the gradual abolition of American extraterritorial privileges in China had been prepared as a basis of discussion between the two governments.

Shanghai Provisional Court.—In February an agreement was signed between China, the United States, and other powers for the reorganization of the Shanghai Provisional Court, which abolishes the deputy judge system and places the clerical force under Chinese control.

LATIN-AMERICAN RELATIONS

By Graham H. Stuart

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REVOLUTIONS IN SOUTH AMERICA

Economic Factor.—The year 1930 has been less notable for the foreign relations of the nations of the western hemisphere than for the serious internal problems brought about by the world wide economic situation. The serious drop in the prices of the various raw materials produced in the several South American countries,—tin in Bolivia; copper, silver, and cotton in Peru; wheat in Argentina; coffee in Brazil,—was undoubtedly one of the principal causes of the unprecedented number of successful revolutions in the more stable South American countries.

Bolivia was the first to overthrow her government when President Siles, unable to meet the June installment of Bolivia's huge foreign debt, resigned for "grave reasons of state." A military junta took over the reins of government and still handles them with elections promised for January, 1931.

Peru was next when the venerable but dynamic Augusto B. Leguia, president for the past eleven years with four years of his third term still to run (he had also been president 1908-1912), was overthrown in August in a practicaly bloodless *coup d'état*. In spite of the remarkable progress that Peru had made during his regime his dictatorship was unable to hold up when the resources of the government could not meet its financial requirements, particularly the salaries of its army officers and the pay for its soldiers.

Argentina. — President Hipolito Irigoyen, another aged dictator, could not maintain his popularity when prices for wheat, corn, wool, hides, and meat fell below the cost of production. In September, General Uriburu took over control of the government and maintained himself in control the rest of the year.

Brazil.—The revolution which broke out in Brazil in October threatened at first to be a long drawn out bloody affair, but when Federal troops deserted in large numbers to the insurgents General Getulio Vargas, former president of the state of Rio Grande do Sul, was able to assume the provisional presidency in less than a month after the original outbreak.

RECOGNITION PROBLEM OF UNITED STATES

Reversal of Policy.—The principal problem raised for the United States by this series of revolutions was the question of recognition. President Wilson inaugurated a policy of refusing to recognize Latin-American governments set up by violence and the United States has followed this policy ever since. However, hitherto the question has been limited to the Caribbean area where American influence is more potent. It was quickly decided by the State Department to reverse this policy in the case of the South American states, and the new governments of Bolivia, Peru, and Argentina were recognized just as quickly as they were seen to be in full control of the situation and were disposed to fulfill their international obligations.

The Case of Brazil.—In the case of Brazil the United States committed a diplomatic *faux pas* by its over-zealous support of the Federal government in permitting it to purchase war equipment in the United States while at the same time declaring an embargo on arms against the revolutionists. Although such a policy was in accord with the precedents established in the Caribbean area, it placed the United States in an embarrassing situation when the revolutionists gained control just two days after the embargo was proclaimed. Nevertheless, on Nov. 8 the United States accorded recognition to the new revolutionary government. It remains to be seen whether the Vargas government will be as cordial toward the United States as the Luis government which it superseded, but as the United States is Brazil's best customer resentment will probably be tempered somewhat by self-interest. The only change as yet noted is the return to the United States of the naval commission which for the past few years has ben advising the Brazilian government.

Argentina.—The new government in Argentina has already shown a greater cordiality towards the United States than the Irigoyen regime. As evidence of his friendly intention, General Uriburu appointed as ambassador to Washington immediately after the recognition of his government Dr. Malbran, who had resigned last year as a protest against the delay in inviting President-elect Hoover to visit Argentina on his Latin-American tour.

DIPLOMATIC APPOINTMENTS

President Hoover continued his policy of appointing career men or trained experts to the important Latin-American posts. E. F. Feely, a member of the Kemmerer financial mission to Bolivia, was given the post of minister to Bolivia; William Dawson, consul-general at Mexico City, was named minister to Ecuador; Fred M. Dearing was transfered from Portugal to Peru; Charles C. Eberhardt, formerly minister to Nicaragua, was sent to Costa Rica, and Dana G. Munro was transfered from the State Department to Haiti. The important position of ambassador to Mexico, vacated by Dwight W. Morrow, was given to J. Reuben Clark, a former under-secretary of state, who had been acting in the capacity of advisor to Ambassador Morrow. J. Butler Wright, another former assistant secretary of state, replaced Leland Harrison as minister to Uruguay.

COMMUNICATIONS

Air Service.—The countries of the western hemisphere were drawn more closely together by the establishment during 1930 of air-mail and passenger service between the United States and the principal Latin-American countries. In September of this year the Pan-American Airways, operating down the west coast of South America, took over the New York, Rio and Buenos Aires company so that at the present time one can travel from New York to Rio de Janeiro, Montevideo and Buenos Aires, cross the Andes to Santiago and then proceed north along the west coast all in the planes of a single company.

Radio Telephone.—A direct radio telephone service between the United States and Argentina, Uruguay, and Chile has also been inaugurated this past year.

BOLIVIA-PARAGUAY DISPUTE

Both Paraguay and Bolivia accepted the tender of good offices of the representatives of Mexico, Cuba, Colombia, Uruguay, and the United States who were serving on the Commission of Inquiry and Conciliation in the Gran Chaco dispute and the two governments signed an agreement April 4 for an exchange of forts to restore the *status quo* of December, 1928, Fort Bosqueron going back to Paraguay and Fort Vanguardia going to Bolivia. Diplomatic relations between the two states were resumed May 1.

THE UNITED STATES AND MEXICO

Visit of President Rubio.—The relations between the United States and Mexico began in a most auspicious manner by a good will visit to the United States of the newly elected president, Pascual Ortiz Rubio, in December and January. It was marred by a slight incident on the Texas border when an over-zealous district attorney threatened to arrest ex-President Calles who was travelling with a diplomatic passport. Mexico immediately retaliated by closing her consulate at Laredo, Tex., for a month and boycotting all American goods. Secretary Stimson finally took up the matter and the incident was closed.

Debt Funding Agreement.—A new agreement for funding the Mexican foreign debt and the debt of the Mexican National Railways to supersede the agreements of 1923 and 1925 was signed in New York July 25, 1930, by the Mexican Minister of Finance and Thomas W. Lamont, representing the International Commission of Bankers on Mexico. It provided for a total payment of approximately $500,000,000 over forty-five years at 5 per cent. It meant a reduction of about $220,000,000 of accumulated interest and was approved by President Ortiz Rubio on August 16.

Approval of Rio Grande Straightening.—President Hoover approved the recommendations of the Mexican-United States Boundary Commission for the straightening of the course of the Rio Grande River from El Paso to Quitman Canyon, Tex., thereby shortening the distance by about 66 miles. The project will require the reciprocal transfer of about 3,500 acres by both countries and will cost about $6,000,000, of which 88 per cent is to be borne by the United States.

Immigration Restriction. — The question of restricting Mexican immigration into the United States raised by the so-called Box Bill seems to have been solved by the State Department without further legislation. By strictly enforcing the regulations forbidding visas to all undesirables, a reduction of some 80 per cent was made during the first six months of the current year, that is a reduction to a monthly average of some 600 instead of the previous monthly average of about 5,000.

Tariff Questions.—The Hawley Smoot Tariff Law passed this year by the United States was no more popular in Mexico than in Argentina. It was claimed to have had a very bad effect on Mexican agricultural production, practically ruining the tomato industry. To reduce if possible the overwhelming balance of trade in favor of the United States, the Mexican tariff commission submitted a plan on Oct. 22 for a heavy increase on import duties on American goods which can be produced in Mexico. It is hoped in this way to reduce imports from the United States by $25,000,000 annually.

THE UNITED STATES AND CUBA

Revolutionary Activities. — The revolutionists in South America had a rather serious repercussion in Cuba, where on a number of occasions riots and revolutionary plots were started against the government of President Machado. Following a statement by Senator Walsh that a serious situation existed which might bear looking into by the United States, the State Department issued a statement Oct. 3 declaring that a close watch was being kept upon affairs in Cuba. When on Dec. 12 it was announced that President Machado had suspended all constitutional guarantees for a period of 60 days, Senator Walsh brought the question formally before the Senate Foreign Relations Committee and suggested that serious consideration be given to the repeal of the Platt Amendment.

The Sugar Problem.—Here again, the serious economic situation was due in considerable part to the low price of sugar. The sugar problem became so acute that in August a committee, headed by Thomas W. Chadbourne as chairman, representing all the financial interests connected with the industry, was formed to make a determined effort to bring production and consumption into at least an approximate balance. An arrangement was finally reached for curtailment of production in Cuba and the United States but the committee then had to deal with the world problem at a conference in Brussels in December, where the German beet sugar growers were unwilling to accept the agreement proposed. The Chase National Bank, which is one of the institutions vitally interested in the sugar industry of the island, arranged for a loan to Cuba of $80,000,000.

Barlow Claim.—The Curban government finally agreed to arbitrate the long outstanding Barlow claim which arose from the confiscation of property belonging to Barlow valued by him at some $9,000,000. A report from Ambassador Guggenheim reduced the valuation to an amount between $500,000 and $1,250,000. When Barlow refused to consider this valuation the State Department refused to take further action.

A new parcel post convention was signed by the United States and Cuba on July 24 permitting Cuba to export tobacco and cigars in packages having a maximum weight of 22 pounds.

THE UNITED STATES AND HAITI

Appointment of Commission.—It will be remembered that in December, 1929, a serious situation arose in Haiti which occasioned the despatch of marines and caused President Hoover to request Congress to authorize the immediate sending of an investigation commission to the island (AMERICAN YEAR BOOK, 1929, p. 39). A commission headed by W. Cameron Forbes and including Henry P. Fletcher, William Allen White, James Kearney, and Elie Vezina, was instructed to find out what could be done to insure a stable government, to discharge our obligations, and when and how to withdraw. The commission arrived Feb. 28 and began hearings immediately. Public and private audiences were given and no responsible citizen was refused a hearing.

Election of President Roy.—The commission found a serious state of unrest existing, due partly to the economic condition caused by the falling price of coffee, but even more so to the hostility towards President Borno and High Commissioner Rusell, who, it was claimed, controlled both President Borno and the Council of State. The commission suggested that Eugene Roy, a business man, be elected temporary president to succeed Borno, whose term expired in April. The temporary president could then call for the election of the assembly, which might elect a president in accordance with the provisions of the constitution. The suggestion was followed and Roy was elected April 21 and inaugurated May 15.

Commission Report.—Meanwhile the Forbes Commission had returned and made its report. Although it gave the American administration credit for the remarkable progress made in health, sanitation, bridge and road building, it found little effort had been made to prepare the Haitians for self-government. In fact, the report stated that "the acts and attitude of the treaty officials gave your commissioners the impression that they had been based upon the assumption that the occupation would continue indefinitely."

Recommendations of the commission may be briefly sumarized as follows: (1) The rapid Haitianization of the services with the definite aim of having Haitians trained to take over the work in 1936; (2) a nonmilitary minister should take over the duties of the High Commissioner and be responsible for the Haitianization of the services; (3) the marines should be gradually removed; (4) a new agreement or a modification of the present treaty providing for less intervention.

Results.—The United States has already appointed Dana Munro as minister to supersede High Commissioner Russell and a new Congress was elected Oct. 14 in accordance with the commission's recommendations, the first since 1917. Mention also should be made of the commission headed by Dr. R. E. Moton of Tuskegee Institute which has made a study of education on the island and reported to President Hoover. The United States has made an excellent even if belated start towards carrying out its promise to withdraw completely from the island in 1936.

THE UNITED STATES AND NICARAGUA

In contrast with 1929 the past year's relations with Nicaragua have been comparatively uneventful. In anticipation of the November elections Capt. A. W. Johnson, U.S.N., at the request of the Nicaraguan government, was appointed to serve as president of the National Board of Elections. Some 280 picked men from the navy arrived in August to be trained to serve as an electoral supervisory commission. The Liberals won the November elections which were said to have been the quietest in Nicaraguan history.

The United States gave evidence of its desire to coöperate with the Nicaraguan government by offering at the latter's request the service of a naval vessel and a naval engineer to aid in picking the most suitable place for a seaport on the Gulf of Fonseca. It was further agreed to furnish airplanes to make airial photographs if considered advisable.

ORIENTAL AND NEAR EASTERN RELATIONS

By Albert Howe Lybyer

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CHINA

Government Status.—Well-wishers of the Chinese people were profoundly discouraged during much of 1930 by the course of events. Colder observers affirmed that old China had disappeared and that only chaos could be discerned. The cessation of organized civil war in October provided some hope in spite of the continuance of brigandage, disorder, and famine. Chiang Kai-shek was head of the government, as President of the Council of State, through the year. The area under full control comprised only a fraction of China in the neighborhood of Nanking. More radical members of the People's Party (Kuomintang) were strong in the south. Chang Hsueh-liang held Manchuria and Yen Hsi-shan, Shansi. Feng Yu-Hsiang was in retirement, but his well-drilled army (Kuominchun) was in readiness. Lesser chiefs controlled other districts. The apparent peace was largely a matter of armies resting in winter quarters, or on furlough.

Extraterritoriality. — The Government negotiated the abolition of extraterritorial rights of foreigners as of Jan. 1, 1930. The most that could be obtained (Germany and Russia excepted) was recognition that on that date a process might be held to begin which would obtain the result desired after China had modernized her legal system effectively.

Economic Matters.—Negotiations were in process also looking toward the completion of tariff autonomy. A serious controversy with Russia over the Chinese Eastern Railway in Northern Manchuria had been settled provisionally and a conference on the subject arranged to meet in Moscow Jan. 25. Dr. Edwin Kemmerer and associates were completing a report on the reform of the monetary system. Trade flourished in the great ports.

Military Operations.—While some fighting took place in February and March, the major civil conflict began in April. Yen resigned his offices in the central government, and through agents took control of Peking, assumed command of his army and declared war on Chiang as a usurping dictator. Feng placed himself at the head of the Kuominchun in full coöperation with Yen. Chiang drew troops from different parts of the country and took comand of armies north of Nanking. Chiang remained aloof from the struggle. A battlefront of 170 or more miles was established between Nanking and the Yellow River. Warfare was conducted both by actual fighting and by espionage and bribery. Chiang possessed more troops and greater resources. Nevertheless the tide seemed for several months to be setting against him. His troops were driven from Tsinan by June 25. A few days earlier the Northerners had taken control of the customs at Tientsin. A robber army called Communist captured and looted Changsha at the end of July. The radical leader Wang Ching-wei came from Canton to Peking, and plans were made to set up a complete government there. Some observers predicted the break-up of China into four units, around Canton, Nanking, Peking and Mukden. The fortunes of war changed when Nanking troops recaptured Tsinan Aug. 15 and pushed northward against Yen and westward against Feng. Perhaps because the struggle seemed to have been decided Chang sent four divisions south and moved toward Peking. At first intervention seemed to have helped the Northerners. They proclaimed a government at Peking Sept. 9, with a Supreme Council and an organic law of 16 articles, but by the end of September this government had vanished, and representatives of Chang held the old capital. Yen and Feng withdrew their armies westward, and later were reported to have proceeded rspectivly to Tokio and Moscow.

Meeting of Kuomintang. — The fourth plenary session of the Kuomintang's central executive committee was held in Nanking from Nov. 12-23, Chang Hsueh-liang attending. He was said to have received $10,000,000 to be applied toward restoring order in the North. Problems of army disbandment, improvement of administration, suppression of banditry and corruption, extinction of the opium traffic, and financial rehabilitation were again taken up. The interior customs, or likin, were ordered abolished from Jan. 1, 1931, and a constitutional convention was planned for May 5.

Government Measures.—The Government proceeded at once to renew demands for abolishing extraterritoriality. Conferences were held on readjustment of debts, cable landings, and the Chinese Eastern Railway. Steps were taken against communists and bandits. The government was thought to be in the strongest position of any in China since the days of Yuan Shih-Kai.

Trade Adjustment.—China's losses on account of the worldwide economic depression, and particularly because of the decline in the value of silver, largely escaped notice in the confusion of civil war, but were none the less severe. Further dislocation of trade was expected from the new higher tariff, which was proclaimed Dec. 29 and went into effect three days later. The abolition of the likin and of various other internal taxes obstructive to trade was expected to be compensated by increase of other taxes, so that a period of radical economic readjustment was to be expected.

JAPAN

General.—The Government of Premier Hamaguchi remained in control, being confirmed in power by an election in February. Economic conditions shared the depression of the rest of the world. In the international field the chief episode was participation in the London Naval Conference and the subsequent ratification of the pact there agreed upon.

Parliamentary Elections.—In November, 1929 Premier Hamaguchi had behind him in the Diet only 172 seats belonging to the Minseito Party, while the Seiyukei controlled 240 seats, the remaining 37 being scattered among five small groups. At the session of Dec. 23 the opposition elected a speaker. While the Seiyukei was disposed to coöperate with the government, and thus hoped to avoid an election, the Diet was dissolved Jan. 21. The Government asked continuance on the basis of the restoration of the gold standard, the balancing of the budget without further borrowing, and the enforcement of strict economy in expenditures. The election was held Feb. 20, some 80 per cent of the voters going to the polls. The Minseito elected 273 members and the Seiyukei 174. The Labor group obtained only 5 members.

Measures of Government.—A plan for increasing the autonomy of the Korean government was approved by the Cabinet Mar. 11. The Diet met in special session Apr. 21. The government's strong position was not shaken by the Opposition's criticism of the results at London and of the general financial conditions of the country.

Castle Statement. — William R. Castle was appointed special ambassador of the United States to Japan Dec. 10, 1929. Shortly after his arrival in the country he made a statement which was interpreted by many Japanese as recognizing a special position for Japan in the Far East similar to that held by the United States in the Western Hemisphere according to the Monroe Doctrine. Later he summarized his view as follows: "What America must learn and can far more easily learn in this era of post-conference trust is that just because Japan's interests here are vital and just because Japan's trade with China is of paramount importance, Japan must be and will be the guardian of the peace in the Pacific."

Immigration.—June 12 W. Cameron Forbes was appointed ambassador to Japan. Japanese feeling because of discrimination in the American immigration act of 1924 was somewhat improved by the proposal May 23 by the Immigration Committee of the House of Representatives that Japan be placed on the list of countries entitled to an immigration quota.

Ratification of London Treaty.—Admiral Kato, chief of the Naval Staff Board, resigned June 11, because of differences in regard to the London Conference Treaty. This treaty was submitted to the Privy Council July 24. A special committee under Count M. Ito considered the treaty for several weeks. At length the Council recommended ratification, and the Emperor signed the treaty Oct. 2. After long debate an agreement was reached between the government and the naval authorities for the expenditure of $186,000,000, to be spread over six years, for increase of the navy under the London Treaty.

TURKEY

Financial Crisis.—The beginning of 1930 found Turkey in a serious financial crisis, with general distress and falling exchange. The government intervened to control exchange and took measures to encourage the use of home products wherever possible. Some money was obtained by a loan from the Italian Commercial Bank, from payment for goods sold to Russia, and from the sale of a monopoly in matches to a Swedish American group. The crops of 1930 were much better than in recent years, but on account of low world prices they failed to relieve the financial situation greatly.

American Treaty.—April 22 the Grand National Assembly ratified a commercial treaty with the United States, which had slipped quietly through the American Senate a few weeks earlier. Thus the series of temporary arrangements between Turkey and America was brought to an end, with a general agreement upon most favored-nation treatment.

Government and Press.—Certain newspapers began attacks upon the government's policy at the end of March. The prosecution of their editors by the Minister of Justice initiated changes which involved that official's downfall after a few months. The government continued to compel the use of the Roman alphabet.

Kurd Revolt.—Early in June a revolt of the Kurds broke out near Mt. Ararat. The government reacted vigorously in a campaign which lasted into the autumn. Persia, Armenia, Iraq, and Syria were all accused by the Turks of aiding the Kurds. Late in the year it was announced that Persia had agreed to cede to Turkey territory near Mt. Ararat in exchange for lands farther south.

Politics.—Ali Fethi, ambassador to France for five years, returned to Turkey in July, and early in August, after conference with President Mustapha Kemal, Prime Minister Ismet and other leaders, announced the formation of a new political party called the Liberal Republican. He accused Ismet's government of unwise foreign policy, bad economic management, and general responsibility for hard times. The President called a special session of Parliament which met from Sept. 21-Oct. 2. The Ismet Cabinet resigned. Ismet was reappointed and left out certain obnoxious members from the new Cabinet. The local elections Oct. 5 showed considerable dissatisfaction with the government. When the Assembly met in regular session Nov. 1, Fethi attacked the government vigorously, charging among other things unlawful interference with the election. The government was sustained by 214 against 10 votes. The Liberal Republicans thereupon voted to dissolve their party. Some think that the whole episode was devised merely to produce a shake-up in the government without radical transformation.

EGYPT

General.—The election of Dec. 21, 1929, gave the Wafd or Nationalist party 206 out of 232 deputies. Mustapha Nahas was summoned Dec. 31 to form a Nationalist Cabinet which attempted to improve the economic situation, but came to grief presently because of an apparently unnecessary attempt to strengthen its constitutional position. A third important task, the settlement of relations with England, also failed to be completed. New customs regulations went into effect Feb. 17, with some disturbance of business on account of heavy importations in advance of the change.

Negotiations with England.—A draft treaty with England which, left over from the previous government, became the starting point of negotiations with England. Nahas, at the head of a commission, opened negotiations in London March 31. Agreement was reached on many points, but because of insistence upon a greater degree of Egyptian participation in the ownership and control of the Sudan than the British were willing to accept, the conference broke up May 8.

Political Events.—May 31 the Cabinet sent to the King the draft of a bill imposing punishments as for treason upon Ministers who might infringe the constitution. The King refused his approval and the Cabinet resigned June 17, thereby abandoning an apparently well-established position. The King thereupon asked Ismail Sidky to form a Ministry, which he selected from minority parties. Parliament was adjourned for one month, and July 12 was closed until November. The Nationalists made various efforts to displace the government but without success. Sidky gave his principal attention to attempts at improving the economic situation. His activities before Oct. 23 probably did not violate the constitution. Upon that date, however, a new constitution was proclaimed, without following the forms prescribed. A new election law was also proclaimed, designed if possible to keep the majority party out of power. While there was much talk in protest against these high-handed actions, the country remained quiet. New elections were set for February or March, 1931. Sidky proceeded to organize a People's Party with a program little different from that of the Nationalists.

SYRIA

French Mandate Policy.—France controlled carefully throughout 1930 the territories assigned to her under the mandate for Syria. Under the single High Commissioner M. Ponsot the country remained in five separate portions called respectively the Syrian State, Sanjak of Alexandretta, government of Latakia, government of Jebel Druze, and Lebanon. Lebanon was given a constitution in 1926. May 22, 1930, the High Commissioner proclaimed a new set of constitutions or organic laws for the remaining regions, together with "an organic regulation of the conference of common interests." The Syrian constituent assembly was declared dissolved. The constitution of the Syrian State was largely identical with the document prepared by that Assembly. The French, however, safeguarded thoroughly their rights under the Mandate, until such time as a treaty might be made with the consent of the League of Nations. The new fundamental laws were accepted quietly, and despite the revolts which broke out in 1925 and the postponement of the publication of the organic laws until eight years after the date of the Mandate, the French regarded the whole process as a successful working out of their policy.

Economic Measures. — Political conditions in the Lebanon were unstable through most of the year, cabinets being overthrown on the ground of partiality and extravagance. Elsewhere the comparative political quiet allowed the government's attention to be given mainly to economic measures, such as the improvement of roads and railways, the extension of the land survey, and the encouragement of agriculture and manufacture. Plans were prepared for improvement of the port of Beirut, rebuilding of Damascus, and irrigation projects. It was expected to bring the French proportion (about one-fourth) of the petroleum of the Mosul region by a branch pipe line to the Syrian port of Tripoli.

PALESTINE

Tasks Under British Mandate.—The affairs of Palestine during 1930 commanded more space in the press of the world than all the remainder of the Near East. The reason was that under the Mandate of 1922 Great Britain undertook the well-nigh incompatible tasks of preserving the rights of the present inhabitants of the country, of setting up self-governing institutions, and also of protecting the establishment in Palestine of a National Home for the Jews. The last task was the most difficult, because ten years ago the Jews constituted only about 11 per cent of the population, and today they have not more than 20 per cent.

Inquiry On Jew-Moslem Rights.—Late in 1929 the British Palestine Inquiry Commission visited Palestine and held many sessions of investigation into the riots of the previous August. In January the Council of the League of Nations provided that the British Government should appoint another commission "to decide and determine the respective rights and claims of Jews and Moslems at the Wailing Wall." Meantime the courts of Palestine conducted a series of trials of both Jews and Arabs who were implicated in the troubles of 1929. The Commission of Inquiry published a report March 31, stating its belief that the fundamental cause of the riots was "the Arab feeling of animosity and hostility toward the Jews, consequent upon the disappointment of their political and national aspirations and fear for their economic future." Recommendations were made that the British Government should issue a clear statement of policy, certain items of which might well be that the rights of non-Jews in Palestine should be safeguarded, that there should be no excessive immigration, and that the peace of the native population on the land should be protected. On April 3 Prime Minister MacDonald issued a preliminary statement in conformity with the ideas of the Commission. Zionists were displeased with the Commission's report. The Arabs of Palestine sent a delegation to London which asked for the abolition of the Balfour declaration. Their extreme demands were refused. May 1 Sir John Hope Simpson was appointed to go to Palestine and together with High Commissioner Sir John Chancellor to prepare a report on economic development, immigration, and land settlement.

British White Paper.—May 27 the British Government issued a White Paper, expressing the intention of working within the limits of the Mandate and in general of following the recommendations of the Commission of Inquiry. The Jewish Agency for Palestine published May 30 a critical analysis of the Commission's report. These documents were placed June 3 before the Permanent Mandates Commission of the League of Nations. Its sessions continued until June 21. The Wailing Wall Commission was in Palestine from June 19-July 19. Two days before its arrival three Arabs were executed for complicity in the outburst of the previous August. These were the only instances of capital punishment, while a considerable number of Arabs and Jews were imprisoned for various terms.

Report of the Mandates Commission, with a reply from Foreign Secretary Arthur Henderson, was published Aug. 25. Both papers used extraordinarily sharp language, the first in criticizing Britain, and the second in charging the Mandates Commission with ignoring evidence.

Simpson Report.—Sir John Hope Simpson's report was published Oct. 20, together with a White Paper, prepared by Mr. Henderson, which declared the future policy of the British Government in the administration of its mandate. The relation of Arabs and Jews to the land was defined, and the intention of proceeding to take steps towards self-government was expressed.

Criticism and Results.—These publications were received with great hostility by Zionist groups. Their leader, Dr. Chaim Weizmann, resigned in great indignation. Conservative and Liberal leaders in England also criticized the government strongly. In the public press and before the House of Commons Oct. 28 and Nov. 17 and before the House of Lords Dec. 3, spirited debates were held. The government stood firmly upon its stated position, affirming that its policy was only the logical consequence of previous declarations and conditions. They were firmly determined to protect fully the interests of both Jews and Arabs, as provided in the Mandate. In Palestine the Arabs were disposed to coöperate with the British Government in the limited form of legislature proposed. The Jews were much less ready. They prepared to decide upon their policy by an election early in January, 1931. Indications were that in the absence of new developments, the Zionist Jews would be compelled to abandon the aim of a Jewish State in Palestine, and accept the National Home as not political, but educational and cultural.

ARABIA

Arbitration Treaty with Iraq.—Near the end of 1929 King Ibn Saud finally defeated rebels in the north, some of whom fled across the frontier into Iraq. This led to negotiations with King Feisal of Iraq, which culminated in a meeting on a British sloop in the Persian Gulf Feb. 24. The two Kings signed a treaty of arbitration, in which they provided for exchange of ambassadors, extradition of fugitives, and the establishment of a permanent frontier commission.

Domestic Situation.—The King went on a pilgrimage to Mecca in state in April, and later passed most of the summer in Taif. The country has reached an amazing degree of order and security. While the King is very conservative on the religious side, he is distinctly open to the use of modern improvements. His policy of converting as many as possible of the nomads into agriculturists is making distinct progress.

IRAQ

Government.—The new High Commissioner Sir Francis Humphreys arrived in Bagdad in December, 1929. The Cabinet was changed in March, Gen. Nuri Pasha as-Said becoming the Prime Minister. On account of agitation among the Kurds in the northern districts, an attempt was made to reconcile them by allowing much local autonomy, with the right to use their own language.

British Treaty.—A new treaty was signed with Great Britain June 30, to establish freer relations between the two governments. For 25 years an alliance will give Iraq full control of her internal affairs, while Britain will have supervision of her foreign affairs. Britain will recommend that Iraq be admitted to the League of Nations in 1932. Iraq will lease three air bases to Great Britain. In view of the new treaty Parliament was dissolved July 4. A new judicial agreement between Great Britain and Iraq was published Sept. 15, which provided a transition toward the complete release of Iraq from the old capitulatory regime. Elections were held, and the new Parliament, meeting in special session Nov. 16, ratified the treaty.

Economic conditions were bad, both because some of the crops were partial failures, and because the prices of what could be sold were very low in the markets of the world.

PERSIA

Riza Shah Pehlevi ruled firmly with the help of a Ministry, a Parliament, and a few foreign advisers, of whom none was American. The currency demanded special attention because the price of silver fell greatly. A gold currency was instituted, with a basal coin, the *riyyal*, of the value of the British shilling, divided into 100 parts. The government repurchased from the British-owned Imperial Bank of Persia for the sum of $1,000,000 that bank's exclusive right to issue paper money. The project of building the new railway fell into great confusion. Americans who were working at the southern end were accused of excessive expenditure and their concession was cancelled. It was subsequently regranted to a French group. Meantime the work already accomplished was reported to have been considerably damaged.

UNITED STATES AND LEAGUE OF NATIONS, WORLD COURT AND INTERNATIONAL LABOR OFFICE

By Arthur Sweetser*

Informationa Section, Secretariat of the League of Nations

INTRODUCTORY

U. S. Relations to the League.—The relations of the United States to the League of Nations during 1930 were more nearly normal, more varied and general than in any previous year. This was due to numerous factors, among which may be mentioned the easing of several problems of the war, the implications of the Kellogg Pact, the wider penetration of the League into world problems, and the natural pressure of self-interest to be present at such discussions.

Limitation of U. S. Role.—Official coöperation took place in fields as diversified as disarmament, international law, protection of coasts, aerial navigation, health, narcotics control and other social problems. Wide though this participation was, it could not, however, by the very nature of things, be complete. The United States, as a non-member of the League, did not participate in the initiation of this work, which mostly took place in the Assembly or the Council; it might or it might not be invited to meetings of interest to it; often it did not have a full part in the preparatory work before a meeting or in the executive work afterwards. Briefly put, the United States might be described as associated in certain committee work of the League.

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* In collaboration with the Geneva Research-Information Committee.

Extension of Conferences.—The quickening of international life has of necessity resulted in a vast extension of the conference method. What could only be done with great effort and at long intervals before the war is now being accomplished continuously and with ease in an integrated centre. Now that the larger war problems are being resolved, the naval accord signed, and the Kellogg Pact operative, the task of the coming years would seem to be to make fully effective the coöperation which the year had shown to be possible between the United States on the one hand, and the League of Nations, the Permanent Court of International Justice and the International Labor Office, on the other.

PERMANENT COURT OF INTERNATIONAL JUSTICE

Appointment of Kellogg.—Two important events marked the relations of the United States to the World Court in 1930: first, the election of Frank B. Kellogg as Judge, and, second, the submission to the Senate by President Hoover of the Protocol for American accession. Mr. Kellogg's election Sept. 17 to the short term made vacant by the resignation of Judge Hughes to become Chief Justice of the United States was followed Sept. 25 by his election to the nine-year term beginning January, 1931. In both cases the Assembly and the Council, voting concurrently, elected him on the first ballot. Although all judges are elected as individuals and not as representatives of their countries, the choice of former Secretary of State Kellogg was formally noted by the State Department in the following statement: "The Department is gratified that Secretary Kellogg has been chosen to fill the unexpired term of Mr. Hughes as Judge of the International Court at the Hague. Mr. Kellogg's name was suggested by the American panel (composed of Elihu Root, John Bassett Moore, Newton Baker, and Roland Boyden). Mr. Kellogg was in no sense an official candidate of this Government; but we may, nevertheless, express our pleasure at the high regard which the American people hold for Mr. Kellogg's legal abilities, his work for peace and for this tribute from the nations of the world which shows that they share our confidence."

Mr. Kellogg Takes Seat.—Mr. Kellogg shortly after took part in the extraordinary session of the Court called Oct. 22 for the hearings on the Zones case between France and Switzerland. While agreeing to adjourn the case for further direct negotiations, he took occasion to point out that the competence of the Court should be clearly defined as between a court of justice and a court of arbitration, and strongly urged that political questions be not admitted to the Court but be settled by other agencies, ample machinery for which is in existence.

The Protocols and the Senate.—The submission to the Senate by President Hoover of the Protocols for American accession to the Court was made Dec. 10, 1930, a year and a day following American signature thereof. Other matters, such as the Naval Treaty, had earlier been given precedence over the Court issue. On Dec. 17, however, the Senate Foreign Affairs Committee voted by 10 to 9 to postpone the question until the next session in December, 1931, and the year ended with uncertainty as to future action.

INTERNATIONAL LAW

Proposed Codification.—Codification of international law is a movement very largely American in origin and impetus. Not only did the United States and the Latin-American States, through the Pan-American conferences, initiate an important program of codification, but various Senate resolutions had been introduced in 1924 urging a third Hague conference for "the clarification and further development of international law."

League Questionnaires.—In 1924, the League Assembly decided to explore the possibilities of this movement. A Committee of Jurists, of which George W. Wickersham was a member, undertook a long preparatory work, during which various League questionnaires were fully answered by the United States, notably in October, 1926, to the effect that "international arrangements on the general subjects of (1) nationality; (2) territorial waters; (3) responsibility of states for injuries caused in their territory to the person or property of foreigners; (4) diplomatic privileges and immunities . . . would serve a useful purpose and would therefore be desirable, and that there would be no insuperable obstacles to the concluding of agreements on these general subjects. . . ."

Nationality.—The first three of these subjects were duly approved for Conference, which sat at The Hague from March 13 to April 13. The United States was represented by a delegation consisting of David Hunter Miller, Green H. Hackworth, Richard W. Flournoy and Ruth B. Shipley, all of the State Department, and Theodore G. Risley of the Department of Labor. To these were added, as technical advisers, Professors Jesse S. Reeves, Manley O. Hudson and Edwin N. Borchard; S. W. Boggs, of the State Department, and Miss Emma Wold. The Conference adopted one general Convention on Nationality, which the United States did not sign, and three Protocols relating to Statelessness and to military obligations in certain cases of double nationality, the latter being signed by the United States Dec. 31, 1930. No conventions resulted on Territorial Waters or Responsibility of States.

Results and Prospects.—The questions chosen turned out to reach far deeper into Government policies than anticipated. While the Conference did not, therefore, achieve the success hoped for, it marked the launching of a new effort for the advancement of international law; its results "need not," as one of the American Delegation stated, "be discouraging to those who see a need for the clarification and systematization of the customary international law through a process of codification." The future of codification was left to consideration by the League Assembly, the different Governments, and general circles of international law. Opinion in the 1930 Assembly, where the American view was not, of course, presented, was much divided. Further discussion, and perhaps final decision, has been left to the 1931 Assembly.

DISARMAMENT

Preparatory Commission Meeting.—The American delegation to the Preparatory Commission for the Disarmament Conference attended the sixth and last session, from Nov. 5 to Dec. 9, with the confidence born of the London Naval Conference, which itself had been the outgrowth of an American declaration at the previous meeting on April 22, 1929. At that time, Ambassador Gibson had strongly urged the American desire for a complete agreement on all categories of naval armaments, in addition to those covered by the Washington Conference, and the Commission had accordingly adjourned, pending the meeting of the naval Powers at London.

The American delegation to this final session was somewhat different from heretofore, both in composition and in action. It consisted of diplomatic career officials and younger service men, all of whom had had much experience, both in armaments negotiations in general and in Geneva methods in particular. Ambassador Hugh Gibson and Minister Hugh R. Wilson were the delegates, assisted by Pierre de L. Boal, of the State Department; J. Pierrepont Moffat, Chargé d'Affaires at Berne, and military, naval and air advisers chosen among men who had previously been to Geneva or stationed abroad. The delegation was, consequently, more fully integrated into the Commission than heretofore. Acting under instructions to press for an early and satisfactory result, it entered fully into the debates and frequently suggested ways of reconciling conflicting views. It left no doubt that it intended to take a full and constructive part in the general World Disarmament Conference, the date of which was left to the League Council the following month.

The Aviation Question.—The Draft Convention virtually took over the naval chapter as prepared by the London Conference. Air armaments, however, raised newer and more difficult questions, especially regarding civil aviation. The American delegation, while favoring the fullest publicity, held it to be dangerous to incorporate provisions as to civil aviation in a treaty for reduction of armaments. Articles were adopted, however, requiring States to refrain from prescribing the embodiment of military features in the construction of civil aviation material and from subsidizing air lines principally established for military purposes.

Statement On Limitation Method.—Land armaments brought about a prolonged discussion as to whether reduction should be by the direct method of enumerating numbers of guns and amount of equipment, or by the indirect method of budgetary limitation. On this question Ambassador Gibson made his principal declaration, stating that, while the United States preferred direct limitation, it was, nevertheless, willing, in order to facilitate agreement, to withdraw its previous objection to the inclusion of budgetary limitation in the Convention. "In withdrawing our reservation," he said, "I made it clear that our convictions were in no wise modified—that we still felt that direct limitation if material was the only one which would work. The withdrawal of our reservation was based on our unwillingness to let it constitute an obstacle to general agreement. . . . If it gives satisfaction to those States which might be reluctant to see us exempted from any limitation, we are willing, provided some practical budgetary method is generally agreed upon which is sufficiently detailed and precise to constitute a real method of limitation, to apply to ourselves a direct limitation of material along lines we have consistently urged for general adoption."

Escape Clause.—The suggestion of the American delegation in regard to the Derogations Article of the Draft Convention was also adopted by the Conference. It provides for an escape clause in case of emergency, but requires a full explanation to the other Parties and to a permanent Disarmament Commission, whereupon the other Contracting Parties should promptly "advise as to the situation thus presented."

ECONOMICS

Avenues of Progress.—The League's economic work, confronted during 1930 by an accumulating world crisis and the obduracy of Governments in not applying the recommendations of the 1927 Economic Conference, devoted itself during the year to a constant but not encouraging exploration of further possible avenues of progress. In most of these negotiations, the United States, though profoundly interested, did not actively participate. She took no part, for instance, in the Assembly discussions on the most-favored-nation clause, European Federation, and Eastern European tariff preference, though her probable views were forcefully expressed by Canada and other overseas nations.

Special Activities.—Of the special economic activities outside the Assembly and Council discussions, the most important in 1930 was the Preliminary Conference for Concerted Economic Action. At its first session, Feb. 17 to March 24, Edwin C. Wilson, First Secretary of the American Embassy in Paris, was assigned by the United States "to be present in Geneva during the period of the Conference . . . with a view to obtaining information regarding the developments of the Conference." At the second session from Nov. 17 to 28, Prentiss Gilbert, of the Geneva Consulate, was present in the same capacity. The other general economic conference attended by the United States during 1930 was that to unify the laws regarding bills of exchange and checks held in Geneva from May 13 to June 7. The importance of the bill of exchange in the world of international trade is easily recognized. American interest in such unification dates back to the Conferences of 1885, 1888, 1910 and 1912. Martin H. Kennedy, U. S. Trade Commissioner in London, participated in this Conference in an expert and advisory capacity.

The League Convention on Import and Export Prohibitions and Restrictions, previously approved by the Senate, came into force for the United States during 1930, being proclaimed by the President March 6. The Convention provides that the Parties "shall communicate to one another through the Secretary-General of the League of Nations a report of the steps taken to give effect thereto."

The League Committee for the Conservation of the Riches of the Sea met in Berlin in April with Dr. Remington Kellogg, member of the Council for the Observation of Whales, present in a personal capacity. The State Department, replying to a League communication as to the regulation of whaling, said, Oct. 17, that the matter had been referred to those in the United States "whose interests might be adversely affected" and that it was "the opinion of the largest consumers of whale oil that the species of whales which are sources of whale oil required for commerce should be protected from indiscriminate slaughter of the type that has been practised in the past. . . ."

Agriculture.—As a result of the World Economic Conference of 1927, the League took up the agricultural question and during 1930 brought together a group of experts to prepare a program of action. In a meeting in January, Loyd V. Steere, United States Agricultural Commissioner in Berlin, served in a personal capacity, presenting a careful analysis of the American wheat situation and suggesting possible methods of action. Lucius Eastman of New York continued to serve on the Economic Committee, which plans the League's work in this field. He was reappointed by the Council in September, 1930, for a three-year period.

FINANCIAL

Personnel.—On the League's Financial Committee, which similarly outlines League work in financial matters, Jeremiah Smith, Jr., of Boston, continued as a member, attending two of its three sessions in 1930.

Greek Refugee Commission.—On Dec. 31, 1930, the work of the Greek Refugee Settlement Commission was finally terminated, thus bringing to a close the exchange of populations and the rehabilitation of refugees carried on under the successive chairmanship of three Americans; first, Henry Morgenthau, former American Ambassador at Constantinople, then Charles P. Howland of New York, and finally Charles B. Eddy of Plainfield, N. J.

Double Taxation.—The work of the League to obviate double taxation made marked progress in 1930. American interest therein had been keen from the first, with Prof. Seligman of New York member of the original Committee, followed by Prof. Thomas S. Adams of Yale as an expert, and later as Government delegate at the general Conference. On May 15, the League Council accepted a donation from the Rockefeller Foundation of $90,000 for a three-year study of the problem and later appointed Mitchell B. Carroll of the Treasury Department to direct it.

Gold Supply.—A special Gold Delegation had also been at work during the year and made a report indicating that the prospective supply of gold might prove insufficient to meet the probable future monetary demands. Prof. O. M. W. Sprague of Harvard and George E. Roberts, Vice-President of the National City Bank of New York, both took active part in the meetings during 1930.

COMMUNICATIONS AND TRANSIT

Buoyage and Lighting.—The League Conference to unify the world's buoyage and lighting systems held at Lisbon Oct. 6-16 was attended by George R. Putnam, U. S. Commissioner of Lighthouses. The United

States had previously coöperated in this effort at unification when H. D. King, of the Department of Commerce, attended the Genoa Conference in February, 1929. Later the United States had invited certain European lighthouse experts to examine the American system. The Lisbon Conference, in spite of long preparation, developed a basic difference between the American and British views and finally agreed, after adopting the other items, including the use of radio for coastguarding, to leave the principal question open with a strong plea to the two delegations to arrive at an agreement, which the others were prepared in advance to accept.

Air Navigation.—During 1930 the United States also accepted the League's invitation to join a committee of technical experts on air navigation "to make a general exploratory study for the coördination of existing efforts and for stimulation of new activities from the viewpoint of economic extension, legal development and the avoidance of military danger." John J. Ide, Technical Assistant in Europe of the National Advisory Committee for Aeronautics, was named as Government expert, but, being unable to attend, was substituted by James W. Riddleberger of the American Consulate in Geneva. A communication was made to the Committee by Col. Charles A. Lindbergh, containing specific suggestions of coöperation in the standardization of airways, a uniform system of marking and signals, a comprehensive meteorological radio system and uniform regulations for registration and clearance.

SOCIAL AND HUMANITARIAN

Health.—It was in the humanitarian field, in connection with matters above political controversy, that American coöperation with the League had first been tested and proved in the early years. In 1930 both official and unofficial contact with this work was continued. Most far-reaching of this work was that of the League's Health Organization. Here Surgeon-General H. S. Cumming of the U. S. Public Health Service had long participated. Government agencies had also coöperated in the exchange of epidemiological information and certain special studies in the United States, and the Philippine Islands Government contributed $2,000 to the expense of the Far Eastern Bureau for Epidemiological Intelligence. On the unofficial side the International Health Board donated $145,000 towards the League's health budget as part of its five year project.

Drugs.—American coöperation in the League's anti-drug work continued during 1930, though somewhat uncertainly. John K. Caldwell of the State Department continued to participate in the Advisory Committee and attended the London Conference of drug manufacturing countries in October. The Government also transmitted an annual report of drug information, replied to several questionnaires, and transmitted through the Dutch Government its data of drug seizures. During the year, also, a League Commission investigating the smoking of opium visited the Philippine Islands and was given every aid by the Governor-General. On the unofficial side Herbert L. May of Pittsburgh attended all four sessions during 1930 of the recently created Central Opium Board.

Traffic in Women.—The League's second enquiry on the traffic in women was sent to the Far East in 1930, Major Bascom Johnson of New York appointed Director of the Field Investigators. The sum of $125,000 was made available by the Bureau of Social Hygiene of New York for the conduct of this investigation, which, with the consent of the Government, also embraced the Philippines.

Forced Labor in Liberia.—During 1930 an investigation on forced labor conditions in Liberia was undertaken by a Committee uniquely constituted. It consisted of Dr. Cuthbert Christy, a British subject appointed by the League Council; Dr. Charles S. Johnson of Fisk University, appointed by the United States, and Sir A. Barclay, appointed by Liberia. By the end of the year, it had submitted a report which Great Britain at once asked to have discussed at the next

Council. The enquiry was important not only in itself but as indicating a new type of coöperation between the United States and the League.

DONATIONS

During 1930, as in previous years, American organizations and individuals showed a tangible interest in many phases of League work by making contributions to increase that work beyond what was provided for in the regular League budget or to make possible new or collateral work which had been shown to be desirable but which was outside the League budget. Beyond the $145,000 provided for the health work, the $125,000 for the Far East Enquiry, and the $90,000 for double taxation already mentioned, a further donation of $10,000 was made by an American who desired to remain anonymous for the preparatory work for the forthcoming conference on the reform of the calendar. Also during the year the $25,000 award of the Woodrow Wilson Foundation was presented to the League "in recognition of its ten years' service in world peace" and was formally accepted by the Council. The gift will be used to construct bronze memorial entrance doors to the new Assembly Hall.

INTELLECTUAL COOPERATION

During 1930 American coöperation in the League's intellectual work continued as in previous years. Dr. Stephen P. Duggan, Director of the Bureau of International Education, served as a member of the Committee of Enquiry to review the whole purpose and organization of this work. The third Conference on Institutions for the Scientific Study of International Relations held in Paris in June, 1930, was attended by Earle B. Babcock of the Carnegie Endowment and Hamilton Fish Armstrong of the Council on Foreign Relations. Similarly, Prof. Hugh A. Smith, Director of the American University Union in Paris, attended the Sub-Committee on Inter-University Relations, and Vernon Kellogg the plenary session of the Committee on Intellectual Coöperation in July. Finally, Laurence Vail Coleman, Director of the American Association of Museums, accepted membership in the Directing Committee of the International Office of Museums.

CORRESPONDENCE AND LIAISON

Diplomatic and Consular Changes.—Facilities for full information and easy and direct communication between the United States and the League were greatly improved during 1930, notably by the removal of the Consulate in Geneva to larger quarters and the strengthening of its staff. Prentiss Gilbert, of the State Department, was transferred to Geneva as head of the Consulate, assisted as regards League work by Consul Curtis T. Everett and Vice-Consuls James W. Riddleberger and Mark Smith. This staff, combined with a strong legation at Berne in charge of Hugh R. Wilson and responsible for the official diplomatic liaison, assured the Government much improved information on the League's many activities.

The League Secretariat.—In the League Secretariat itself the increased official and unofficial contact with America "made it necessary," as an official report said, "to appoint in the Information Section an additional member of section and an additional short-hand typist." This was interpreted in *The New York Times* as an "acknowledgment of the extent, financial and otherwise, to which the United States had recently been contributing to League work."

Treaty Transmission.—During the year the United States, though as a non-member not obligated to transmit its treaties as part of the effort to abolish secret diplomacy, nevertheless, continued to do so for information and for inclusion in the League's Treaty Series. The State Department also purchased many subscriptions for the League Treaty Series to be distributed amongst its embassies and legations. Its friendly coöperation was further manifested in its presenting a set of special plates for the reproduction of the Amharic text of its treaty with Ethiopia.

INTERNATIONAL LABOR OFFICE

Silicosis Conference.—American coöperation with the work of the International Labor Office was signalized in 1930 by its first official representation at a Labor Office Conference since 1920 when it attended the Silicosis Conference held in Johannesburg, South Africa, in November. This Conference, called to consider one of the most serious maladies threatening the mining community throughout the world, was attended by Assistant Surgeon-General A. E. Russell of the U. S. Public Health Service, and Dr. L. U. Gardner of Saranac Lake. The Conference drew up recommendations pertaining to medical care, medical assistance, compensation and further research to be undertaken jointly by the authorities of the countries concerned and the International Labor Office.

Wage Investigation.—The investigation undertaken by the Labor Office at the suggestion of the Ford Motor Company of England and with the assistance of the Twentieth Century Fund and E. A. Filene of Boston, to determine the relative levels of real wages in European cities compared with Detroit, was largely based on statistical data prepared by the United States Department of Labor. The results will be published early in 1931.

Industrial Relations.—On the unofficial side Industrial Relations of New York continued to maintain a member of its staff at the Labor Office in Geneva to deal with subjects relating to industrial relations and contributed $12,000 for research thereon.

Miscellaneous.—Similarly, the Social Science Research Council continued its collaboration with the Labor Office in the pursuit of studies on comparative wage statistics. Finally, the visit to the United States of H. B. Butler, Deputy Director of the Office, gave opportunity not only to enter into contact with important official, industrial, and labor leaders, but also to visit the Washington Bureau of the Office.

INTERNATIONAL CONFERENCES

By William T. Stone

Washington Representative, Foreign Policy Association

SCOPE OF AMERICAN PARTICIPATION

The United States has taken part in more than sixty international conferences in 1930.* These range in importance from the Naval Conference to the Fourth World's Poultry Congress held in London. American delegates participated, for example, in international gatherings for the consideration of prison reform, public health, aviation, radio communication, railway and road development, agriculture, forestry, and animal industry, as well as other scientific, technical and social problems. In 1930 as in 1929, the most important conferences in which the United States participated were those held under the auspices of the League of Nations. Since the creation of the League that organization has taken over the continuing work of an increasing number of international agencies which functioned independently, and often with duplication, in the past. Thus the League has set up committees on communication and transit, economic and financial questions, public health and social problems.

LEAGUE OF NATIONS CONFERENCES

Codification of International Law.—Although not a member of the League of Nations, the United States since 1924 has co-operated in these non-political activities of the League. In 1930 the American Government was represented by official delegations at several of the most important League conferences. A large delegation headed by David Hunter Miller, of the State Department, represented the United States at the First Conference on Codification of International Law which met at The Hague from March 13, 1930, to April 13, 1930. This conference, at which more than forty nations were represented, dealt with three projects: Territorial Waters, Responsibility of States, and Nationality. Due to differences of opinion conventions were not adopted for the first two subjects. While a convention on Nationality was adopted, the American delegation, with the approval of the State Department, declined to sign on the ground that sections of the draft treaty were contrary to principles embodied in our domestic law.

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*The results of the London Naval Conference are reviewed elsewhere in this volume.

Buoyage and Coast Lighting.—The United States also was officially represented at the conference on Unification of Buoyage and Lighting of Coasts which met in Lisbon, Portugal, October 6, 1930. George R. Putnam, Commissioner of Lighthouses of the Department of Commerce, served as the American delegate.

Bills of Exchange.—While not participating officially, the United States was represented by experts serving in an "advisory capacity" at the League conference for Unification of Legislation on Bills of Exchange which met in Geneva during May, 1930.

Economic Action.—The conference on Concerted Economic Action, which met in Geneva during March for the purpose of bringing about a tariff truce, was limited principally to European States. Edwin C. Wilson, First Secretary of the American Embassy in Paris, was requested to be in Geneva to report directly to the State Department on the work of the conference.

Disarmament.—Since 1925 the disarmament work of the League of Nations has been carried on through the Preparatory Commission for the disarmament conference. The United States has been represented on this commission at each of its sessions. It was again represented by Hugh S. Gibson, American Ambassador to Belgium, and Hugh R. Wilson, American Minister to Switerland, at the second part of the sixth session which met at Geneva beginning Nov. 6, 1930. It was at the last meeting of the Preparatory Commission in April, 1929, that Ambassador Gibson inaugurated the steps which led directly to the calling of the London Naval Conference. At the 1930 session the Commission was endeavoring to complete a draft treaty for the limitation of land, air, and naval armaments to be submitted to the General Disarmament Conference, which it was hoped the League would be able to call in 1931 or 1932. At this meeting the position of the United States on several questions relating to land armaments, particularly the proposal for budgetary limitation, assumed great importance. The United States was left with a small minority in opposing this method of limitation.

League Committees.—In addition to participating in these League of Nations conferences, the United States has continued to be represented either by government officials or private citizens on most of the continuing committees set up by the League of Nations to deal with technical or social matters. Thus John K. Caldwell of the State Department attended the January meeting of the Opium Advisory Committee in an "expert advisory capacity." Individual American citizens appointed by the League served on other League committees: Lucius Eastman at the June meeting of the economic committee; Charles B. Eddy and Jeremiah Smith, Jr., at the meeting of the financial committee; Prof. O. M. Sprague and George M. Roberts on the gold committee; Dr. Stephen P. Duggan at meetings of the committee of intellectual co-operation; Herbert L. May at the meetings of the permanent central opium board; Bascom Johnson and others on the committee for protection and welfare of children.

Thus, to an increasing extent, the United States is co-operating with the League of Nations in most of its non-political activities. The extent of this co-operation was emphasized during the year by a report published by the Research Committee of the Geneva Office League of Nations Association in which all specific cases of American participation were listed.

PAN-AMERICAN UNION

Conferences.— Another international agency through which the United States has participated in important international conferences is the Pan-American Union. A number of Pan-American conferences were held during the year 1930. Among others the United States participated in the Six Pan-American Child Congress held in Lima, Peru, in July; a conference of Educators held at Havana in February, and an Inter-American Conference on Agriculture, Forestry, and Animal Industry held in Washington in September.

Honduras-Guatemala Arbitration.—A political conference of some importance, in which the United States used its good offices to assist in the settlement of the long standing Honduras-Guatemala boundary dispute, was held in Washington, beginning in January, 1930. As a result of this conference the two Central American governments agreed to submit the case to arbitration. A board of arbitrators, with Chief Justice Charles Evans Hughes of the United States as umpire, is to be set up to hear the arguments of the two governments.

Treaties.— While the United States continued to take its part in international conferences, it has not, during 1930, ratified all of the treaties or conventions resulting from conferences of previous years. Thus, three conventions signed at the Sixth Pan-American Conference, held in Havana in 1928, and the important Pan-American arbitration treaty, signed in January, 1929, in which the United States agreed to a procedure of peaceful settlement of Inter-American disputes have not yet been acted upon by the Senate. Several League of Nations conventions are also still awaiting final action by the Senate. Among these are the convention for the supervision of international trade in arms and ammunition, and the Protocol for the prohibition of poisonous gases, both of which were signed at Geneva, June 17, 1925, and sent to the Senate, Jan. 12, 1926.

THE INSTITUTE OF POLITICS

By Walter Wallace McLaren

Executive Secretary, Institute of Politics

SCOPE AND PURPOSES

The Institute of Politics was founded to encourage among adults a scientific study of international relations. Its emphasis has always been upon facts, the acquiring of facts, and their evaluation. It has built up during a period of ten years a clientele which it has educated to distrust emotions and sentiment, to seek information as the basis for the views they hold with regard to the foreign policies of the United States and other countries.

Questions which the Institute includes for discussion in its annual programs are determined by its Board of Advisers, and the personnel of its instructional staff is likewise selected in accordance with the best advice available. Decisions of this kind are made months before the session begins, and the success of each session depends upon the wisdom of the judgment thus exercised; the members of the Institute are moved to come to a session by the quality of the instructional staff and the timeliness of the questions included for discussion in the program.

PROGRAM FOR TENTH SESSION

The advisers and managers of the Institute decided to build a program for the Tenth Session around the general concept of Western Civilization. They recognized that the world must be divided into two broad groups of nations,—first, the industrial nations of the west, and second, the rest of the world. It was recognized that in both groups there are nations in different stages of evolution, but that in the second group these variations are greatest. Nearly all the problems of foreign relations arise out of these differences in the degree of civilization attained by different peoples. No scientific treatment of the problems of foreign affairs is possible without recognizing this fact. For example, the rising nationalism in India, Egypt, or China cannot be regarded as movements to which aid and comfort are to be given without discriminating analyses of the particular stage of evolution toward western civilization which the country or the region in question has attained. Similarly, the attitude of western nations toward one another must depend upon an analysis not only of their own objectives, but of the relative abilities of each to reach those objectives. It is important to know, for example, what a country like France has in mind when she places herself at the head of Western Europe, gathering around her a group of satellites, the Little Entente, and emphasizing the necessity of security before she agrees to any action in the direction of disarmament. Similarly, what has Italy in mind? The question also arises as to the meaning of Great Britain's isolation and her intentions in the British commonwealth of nations; or what the United States has in mind with her Pan-American policy. Are the great western nations really seeking to build up regional groups, to realign the nations of the world for new economic and political purposes? Can these countries reach their objectives without danger of conflict with each other?

With all this in mind, the program for 1930 was constructed. The nucleus was a conference and a group of lectures on "An Analysis of Western Civilization" and around this were grouped lectures and discussions on Disarmament, Aviation, and the Economic Progress of Europe; still wider afield, the problems arising in regions outside of Europe,—in Russia, India, the Far East, Latin America, and the Arctic and Antarctic. To the managers of the Institute, this seemed a systematic treatment of the main features of the current international situation. By a search for facts relating to these questions, that search being carried on by a group of experts and assisted by the members of the Institute, it was reasonable to suppose that the foreign relations of our own and other countries would be seen in something like a scientific perspective.

LECTURES AND ADDRESSES

The following courses of lectures were given: France and the Disarmament Problem, Dr. Paul Mantoux, Paris; The Freedom of the Seas, Lord Eustace Percy, London; and The Evolution of International Public Law in Europe Since Grotius, Dr. Walter Simons, Berlin. In addition, the following addresses were delivered by: Western Civilization and the World, Professor C. DeLisle Burns, London, and India and Nationalism, Lord Meston, London.

ROUND TABLES

The following is a list of the round table subjects, with their respective leaders: The Far Eastern Situation, Professor George H. Blakeslee, Clark University; An Analysis of Western Civilization, Professor C. DeLisle Burns, University of London; Recent Economic Progress in Europe, Professor Edwin F. Gay, Harvard University; Limitation of Armaments, Admiral A. J. Hepburn, United States Navy; Pan-American Problems, Professor Jesse S. Reeves, University of Michigan; and The Political Aspects of Aerial Navigation, Edward P. Warner, Editor, *Aviation*, New York.

GENERAL CONFERENCES

Each of the above round table conference leaders conducted two general conference meetings, which were attended by the entire membership of the Institute. Additional general conferences were held as follows: The Domestic and Foreign Problems of Russia, Ivy Lee, New York; The Arctic and the Antarctic, Dr. Laura H. Martin, Washington; Arbitration and Intervention in the Caribbean Area, Henry K. Norton, New York, and India and Nationalism, Lord Meston of Agra and Dunottar.

COGNATE SOCIETIES

GENERAL

ACADEMY OF POLITICAL SCIENCE IN THE CITY OF NEW YORK, Fayerweather Hall, Columbia University, New York City.

AMERICAN PEACE AWARD, 565 Fifth Ave., New York City.

AMERICAN SOCIETY OF INTERNATIONAL LAW, 2 Jackson Place N. W., Washington, D. C.

ARBITRATION SOCIETY OF AMERICA, INC., 342 Madison Ave., New York City.

CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE, 2 Jackson Place N. W., Washington, D. C.

COUNCIL OF ARBITRATION, 342 Madison Ave., New York City.

COUNCIL ON FOREIGN RELATIONS, INC., 25 West 43rd Street, New York City.

EMERGENCY FOREIGN POLICY CONFERENCE, 1414 Monadnock Bldg., Chicago, Ill.

FOREIGN POLICY ASSN., 18 East 41st Street, New York City.

INSTITUTE OF CURRENT WORLD AFFAIRS, 522 Fifth Ave., New York City.

INTERNATIONAL LAW FOUNDATION, 165 Broadway, New York City.

INTERNATIONAL REFORM FEDERATION, 206 Pennsylvania Ave. S. E., Washingon, D. C.

LEAGUE OF NATIONS NON-PARTISAN ASSN., 6 East 39th Street, New York City.

LEAGUE OF NATIONS UNION, 70 Fifth Ave., New York City.

NATIONAL COUNCIL FOR PREVENTION OF WAR, 532 17th Street N. W., Washington, D. C.

PEOPLE'S RECONSTRUCTION LEAGUE, 35 B Street N. W., Washington, D. C.

WOMEN'S INTERNATIONAL LEAGUE FOR PEACE AND FREEDOM, 15 East 40th Street, New York City.

WOMEN'S PEACE SOCIETY, 20 Vesey Street, New York City.

WOMEN'S PEACE UNION, 39 Pearl Street, New York City.

WORLD PEACE FOUNDATION, 40 Mount Vernon Street, Boston, Mass.

REGIONAL

ARMENIA-AMERICA SOCIETY, 289 Fourth Ave., New York City.

AMERICAN COMMITTEE FOR ARMENIAN INDEPENDENCE, 1 Madison Ave., New York City.

AMERICAN ASIATIC ASSN., 501 Fifth Ave., New York City.

CHINA SOCIETY OF AMERICA, 19 West 44th Street, New York City.

COMMITTEE ON COOPERATION IN LATIN AMERICA, 419 Fourth Ave., New York City.

ENGLISH-SPEAKING UNION OF THE UNITED STATES, 19 West 44th St., New York City.

FAR EAST CONFERENCE, 25 Beaver Street, New York City.

FRENCH INSTITUTE OF THE UNITED STATES, 22 East 60th Street, New York City.

FRIENDS OF BELGIUM, 32 Broadway, New York City.

FRIENDS OF FREEDOM FOR INDIA, 799 Broadway, New York City.

FRIENDS OF IRISH FREEDOM, 280 Broadway, New York City.

JAPAN SOCIETY, INC., 36 West 44th Street, New York City.

NATIONAL ASSN. FOR PROTECTION OF AMERICAN RIGHTS IN MEXICO, 17 Battery Place, New York City.

NETHERLANDS ASSN. OF NORTH AMERICA, 179 S. Trenchard Street, Yonkers, N. Y.

PAN - AMERICAN SOCIETY OF THE UNITED STATES, INC., 67 Broad Street, New York City.

PAN - PACIFIC UNION, Honolulu, Hawaii.

PERSIA SOCIETY, 110 East 42nd St., New York City.

SOCIETY OF THE FRIENDS OF ROUMANIA, INC., 36 West 44th Street, New York City.

PART TWO
AMERICAN GOVERNMENT

DIVISION III
THE NATIONAL GOVERNMENT

PERSONNEL OF CONGRESS, 1930-31

By Milton Conover

Associate Professor, Yale University

HOUSE OF REPRESENTATIVES

Political Alignment.—When the Third Session of the 71st Congress assembled Dec. 1, 1930, the political party alignment in the House of Representatives was: Republicans 266, Democrats 167, Farmer-Labor 1, with one vacancy. As compared with the alignment of the Second Session of the same Congress, this represented a loss of three Representatives by each of the major parties. For the rolls of the Second Session were: Republicans 263, Democrats 164, Farmer-Labor 1, with seven vacancies. [American Year Book, 1929, pp. 59-63.]

Membership Changes.—These variations may be traced to the fact that there were thirteen changes in the membership of the House when it met on Dec. 1. These changes involved two new members each from Illinois, North Carolina, and Pennsylvania. The remaining seven members were elected from the seven states of Arkansas, Connecticut, Kentucky, Rhode Island, Utah, West Virginia, and Wisconsin. These changes were due to two causes only: resignation and death. The resignations were three: Representatives Thomas S. Williams of Illinois, David H. Kincheloe of Kentucky, and Jeremiah E. O'Connell of Rhode Island. Of these, Representative Williams had been selected in 1930 to fill a vacancy for Illinois. Elected to fill the vacancies due to these resignations respectively were Representatives Claude V. Parsons of Illinois, John L. Dorsey, Jr., of Kentucky, and Francis B. Condon of Rhode Island.

Vacancies.—Death caused vacancies in the places formerly occupied by the late Representatives Otis Wingo of Arkansas, James P. Glynn of Connecticut, Edward J. King of Illinois, Charles M. Stedman of North Carolina, William C. Hammer of North Carolina, Edgar R. Kiess of Pennsylvania, Stephen G. Porter of Pennsylvania, Elmer O. Leatherwood of Utah, James A. Hughes of West Virginia and Florian Lampert of Wisconsin. Of unusual significance was the passing of Representative Stedman of North Carolina in that he was the last of the Confederate veterans to hold a seat in Congress. Representative King had been elected in 1930 to fill a vacancy for Illinois, and Representative Leatherwood had been elected in Utah for a similar purpose.

To fill these ten vacancies caused by death the following representatives were elected: Effiegene Wingo of Arkansas, Edward W. Goss of Connecticut, Burnett M. Chiperfield of Illinois, Frank W. Hancock, Jr., of North Carolina, Hinton James of North Carolina, Robert F. Rich of Pennsylvania, Edmund F. Erk of Pennsylvania, Frederick C. Loofbourow of Utah, Robert L. Hogg of West Virginia, Michael K. Reilly of Wisconsin. Mrs. Wingo was elected to succeed her late husband for unexpired term and for the 72d Congress.

The personnel analysis of these thirteen new representatives compares favorably with that of the collective membership of the whole House as presented in the AMERICAN YEAR BOOK, 1929 (pp. 59-63). The professions represented included seven lawyers, two manufacturers, one teacher, a banker, and two members whose professions are not given in the Congressional Directory. Nine of the new representatives are college men representing the Universities of California, North Carolina, Wisconsin, West Virginia, Georgetown, and the old-fashioned classical colleges of Centre, Davidson and Dickinson. Five of this group had served in State legislatures and six of them had World War records.

THE SENATE

The Senate, during this Third Session, was affected by the death of Senator Frank L. Greene of Vermont, who had entered the House in 1912. Senator David Baird, Jr., of New Jersey, who had been but recently appointed to fill the unexpired term of Walter E. Edge after the latter had accepted an appointment as ambassador to France, also retired. He was succeeded by Dwight W. Morrow, who resigned as ambassador to Mexico to become a Senator from New Jersey. Otherwise, the personnel of the Senate remained substantially as it was during the Second Session.

MEMBERS OF THE SENATE

Compiled from the Congressional Directory, Year 1930

Dates show beginning of service in the Senate. Names of Republicans are in Roman type; those of Democrats in *Italic;* Farmer-Labor in ROMAN CAPS.

ALABAMA

J. Thomas Heflin (1920).
Hugo L. Black (1926).

ARIZONA

Henry F. Ashurst (1912).
Carl Hayden (1927).

ARKANSAS

Joseph T. Robinson (1913).
T. H. Caraway (1921)

CALIFORNIA

Hiram W. Johnson (1917).
Samuel M. Shortridge (1921).

COLORADO

Lawrence C. Phipps (1919).
Charles W. Waterman (1926).

CONNECTICUT

Hiram Bingham (1924).
Frederic C. Walcott (1929).

DELAWARE

Daniel O. Hastings (1929).
John G. Townsend, Jr. (1929).

FLORIDA

Duncan U. Fletcher (1909).
Park Trammell (1917).

GEORGIA

William J. Harris (1919).
Walter F. George (1922).

IDAHO

William E. Borah (1907).
John Thomas (1928).

ILLINOIS

Charles S. Deneen (1925).
Otis F. Glenn (1928).

INDIANA

James T. Watson (1916).
Arthur R. Robinson (1925).

IOWA

Daniel F. Steck (1924).
Smith W. Brookhart (1922).

KANSAS

Arthur Kapper (1919).
Henry J. Allen (1929).

KENTUCKY

Alben W. Barkley (1927).
John M. Bobsion (1930).

LOUISIANA

Joseph E. Ransdell (1913).
Edwin S. Broussard (1921).

MAINE

Frederick Hale (1917).
Arthur R. Gould (1926).

MARYLAND

Millard E. Tydings (1923).
Phillips L. Goldsborough (1929).

MASSACHUSETTS

Frederick H. Gillett (1925).
David I. Walsh (1926).

MICHIGAN

James Couzens (1922).
Arthur H. Vandenberg (1928).

MINNESOTA

HENRIK SHIPSTEAD (1923).
Thomas D. Schall (1925).

MISSISSIPPI

Pat Harrison (1919).
Hubert D. Stephens (1923).

MISSOURI

Harry B. Hawes (1926).
Roscoe C. Patterson (1929).

MONTANA

Thomas J. Walsh (1913).
Burton K. Wheeler (1923).

NEBRASKA

George W. Norris (1913).
Robert B. Howell (1923).

NEVADA

Key Pittman (1913).
Tasker L. Oddie (1921).

NEW HAMPSHIRE

George H. Moses (1918).
Henry W. Keyes (1919).

NEW JERSEY

Hamilton F. Kean (1929).
David Baird, Jr. (1929).

NEW MEXICO

Sam G. Bratton (1925).
Bronson Cutting (1929).

NEW YORK

Royal S. Copeland (1923).
Robert F. Wagner (1926).

NORTH CAROLINA

Furnifold M. Simmons (1901).
Cameron Morrison (1930).

NORTH DAKOTA

Lynn J. Frazier (1923).
Gerald P. Nye (1925).

OHIO

Simeon D. Fess (1923).
Roscoe C. McCulloch (1929).

OKLAHOMA

W. B. Pine (1925).
Elmer Thomas (1927).

OREGON

Charles L. McNary (1918).
Frederick Steiwer (1926).

PENNSYLVANIA

David A. Reed (1922).
Joseph R. Grundy (1929).

RHODE ISLAND

Jesse H. Metcalf (1924).
Felix Hebert (1929).

SOUTH CAROLINA

Ellison D. Smith (1909).
Coleman L. Blease (1925).

SOUTH DAKOTA

Peter Norbeck (1921).
William H. McMaster (1925).

TENNESSEE

Kenneth McKellar (1917).
William E. Brock (1929).

TEXAS

Morris Sheppard (1913).
Tom Connally (1929).

UTAH

Reed Smoot (1903).
William H. King (1917).

VERMONT

Porter H. Dale (1923).
Frank C. Partridge (1930).

VIRGINIA

Claude A. Swanson (1910).
Carter Glass (1920).

WASHINGTON

Wesley L. Jones (1909).
Clarence C. Dill (1923).

WEST VIRGINIA

Guy D. Goff (1925).
Henry D. Hatfield (1929).

WISCONSIN

Robert M. LaFollette, Jr. (1925).
John J. Blaine (1926).

WYOMING

John B. Kendrick (1917).
Patrick J. Sullivan (1929).

MEMBERS OF THE HOUSE OF REPRESENTATIVES

Compiled from the Congressional Directory, Year 1930

Dates show the beginning of service in the House. Names of Republicans are in Roman type; those of Democrats in *Italic*, and of Farmer-Labor in

ALABAMA

1. *John McDuffie* (1919).
2. *Lister Hill* (1923).
3. *Henry B. Steagall* (1915).
4. *Lamar Jeffers* (1921).
5. *Lafayette L. Patterson* (1928).
6. *William B. Oliver* (1915).
7. *Miles C. Allgood* (1923).
8. *Edward B. Almon* (1915).
9. *George Huddleston* (1915).
10. *William B. Bankhead* (1917).

ARIZONA

At Large—*Lewis W. Douglas* (1927).

ARKANSAS

1. *William J. Driver* (1921).
2. *Pearl Peden Oldfield* (1929).
3. *Claude A. Fuller* (1929).
4. *Effiegene Wingo* (1930).
5. *Heartsill Ragon* (1923).
6. *D. D. Glover* (1929).
7. *Tilman B. Parks* (1921).

CALIFORNIA

1. *Clarence F. Lea* (1917).
2. Harry L. Englebright (1926).
3. Vacant.
4. Florence P. Kahn (1925).
5. Richard J. Welch (1925).
6. Albert E. Carter (1925).
7. Henry E. Barbour (1919).
8. Arthur M. Free (1921).
9. William E. Evans (1926).
10. Joe Crail (1927).
11. Philip D. Swing (1921).

COLORADO

1. William R. Eaton (1929).
2. Charles B. Timberlake (1915).
3. Guy U. Hardy (1919).
4. *Edward T. Taylor* (1909).

CONNECTICUT

1. E. Hart Fenn (1921).
2. Richard P. Freeman (1915).
3. John Q. Tilson (1915).
4. Schuyler Merritt (1917).
5. Edward W. Goss (1930).

DELAWARE

At large—Robert G. Houston (1925).

FLORIDA

1. *Herbert J. Drane* (1917).
2. *Robert A. Green* (1925).
3. *Thomas A. Yon* (1927).
4. *Ruth Bryan Owen* (1929).

GEORGIA

1. *Charles G. Edwards* (1925).
2. *E. E. Cox* (1925).
3. *Charles R. Crisp* (1913).
4. *William C. Wright* (1918).
5. *Robert Ramspeck* (1929).
6. *Samuel Rutherford* (1925).
7. *Malcolm C. Tarver* (1927)
8. *Charles H. Brand* (1917).
9. *Thomas M. Bell* (1905).
10. *Carl Vinson* (1914).
11. *William C. Lankford* (1919).
12. *William W. Larsen* (1917).

IDAHO

1. Burton L. French (1917).
2. Addison T. Smith (1913).

ILLINOIS

At large—Richard Yates (1919).
Ruth Hanna McCormack (1929).

1. Oscar De Priest (1929).
2. Morton D. Hull (1923).
3. Elliott W. Sproul (1921).
4. *Thomas A. Doyle* (1923).
5. *Adolph J. Sabath* (1907).

6. *James T. Igoe* (1926).
7. M. A. Michaelson (1921).
8. *Stanley H. Kunz* (1921).
9. Fred A. Britten (1913).
10. Carl R. Chindblom (1919).
11. Frank R. Reid (1923).
12. John T. Buckbee (1926).
13. William R. Johnson (1925).
14. John C. Allen (1925).
15. Burnett M. Chiperfield (1930).
16. William E. Hull (1923).
17. Homer W. Hall (1927).
18. William P. Holaday (1923).
19. Charles Adkins (1925).
20. *Henry T. Rainey* (1923).
21. Frank M. Ramey (1929).
22. E. M. Irwin (1925).
23. *William W. Arnold* (1923).
24. *Claude V. Parsons* (1930).
25. Edward E. Denison (1915).

INDIANA

1. Harry E. Rowbottom (1925).
2. *Arthur H. Greenwood* (1923).
3. James W. Dunbar (1929)
4. *Harry C. Canfield* (1923).
5. Noble J. Johnson (1925).
6. Richard N. Elliott (1917).
7. *Louis Ludlow* (1929).
8. Albert H. Vestal (1917).
9. Fred. S. Purnell (1917).
10. William R. Wood (1915).
11. Albert R. Hall (1925).
12. David Hogg (1925).
13. Andrew J. Hickey (1919).

IOWA

1. William F. Kopp (1921).
2. F. Dickinson Letts (1925).
3. T. J. B. Robinson (1923).
4. Gilbert N. Haugen (1899).
5. Cyrenus Cole (1921).
6. C. W. Ramseyer (1915).
7. Cassius C. Dowell (1915).
8. Lloyd Thurston (1925).
9. C. E. Swanson (1929).
10. L. J. Dickinson (1919).
11. E. H. Campbell (1929).

KANSAS

1. W. P. Lambertson (1929).
2. U. S. Guyer (1926).
3. W. H. Sproul (1923).
4. Homer Hoch (1919).
5. James G. Strong (1919).
6. Charles I. Sparks (1929).
7. Clifford R. Hope (1926).
8. W. A. Ayres (1923).

KENTUCKY

1. *William V. Gregory* (1927).
2. *John L. Dorsey, Jr.* (1930).
3. *John W. Moore* (1925).
4. J. D. Craddock (1929).
5. M. H. Thatcher (1923).
6. J. L. Newhall (1929).
7. Robert Blackburn (1929).
8. Lewis L. Walker (1929).
9. E. R. Kendall (1929).
10. Katherine Langley (1927).
11. Charles Finley (1930).

LOUISIANA

1. *James O'Connor* (1919).
2. *J. Z. Spearing* (1924).
3. *Numa F. Montet* (1929).
4. *John N. Sandlin* (1921).
5. *R. J. Wilson* (1915).
6. *B. E. Kemp* (1925).
7. *R. L. DeRouen* (1927).
8. *James B. Aswell* (1913).

MAINE

1. C. L. Beedy (1921).
2. W. H. White, Jr. (1917).
3. John E. Nelson (1922).
4. Donald F. Snow (1929).

MARYLAND

1. *T. A. Goldsborough* (1921).
2. Linwood L. Clark (1929).
3. *V. L. Palmisano* (1927).
4. *J. C. Linthicum* (1911).
5. *S. W. Gambrill* (1924).
6. F. N. Zihlman (1917).

MASSACHUSETTS

1. A. T. Treadway (1913).
2. *W. J. Granfield* (1930).
3. Frank H. Foss (1925).
4. George R. Stobbs (1925).
5. Edith N. Rogers (1925).
6. A. Piatt Andrew (1921).
7. *W. P. Connery, Jr.* (1923).
8. F. W. Dallinger (1927).
9. C. I. Underhill (1921).
10. *John J. Douglass* (1925).
11. G. H. Tinkham (1915).
12. *J. W. McCormack* (1928).
13. Robert Luce (1919).
14. R. B. Wigglesworth (1928).
15. J. W. Martin, Jr. (1925).
16. Charles L. Gifford (1922).

MICHIGAN

1. Robert H. Clancy (1927).
2. Earl C. Michener (1919).
3. Joseph L. Hooper (1925).
4. John C. Ketcham (1921).
5. Carl E. Mapes (1913).
6. Grant M. Hudson (1923).
7. Louis C. Cramton (1913).
8. Bird J. Vincent (1923).
9. J. C. McLaughlin (1907).
10. Roy O. Woodruff (1921).
11. Frank P. Bohn (1926).
12. W. Frank James (1915).
13. C. J. McLeod (1923).

MINNESOTA

1. Victor Christgau (1929).
2. Frank Clague (1921).
3. A. H. Andresen (1925).
4. Melvin J. Maas (1927).
5. William I. Nolan (1929).
6. Harold Knutson (1917).
7. PAUL J. KVALE (1923).
8. W. A. Pittenger (1929).
9. Conrad G. Selvig (1926).
10. G. G. Goodwin (1925).

MISSISSIPPI

1. *John E. Rankin* (1921).
2. *Wall Doxey* (1929).
3. *W. M. Whittington* (1925).
4. *Jeff Busby* (1923).
5. *Ross A. Collins* (1921).
6. *Robert S. Hall* (1929).
7. *Percy E. Quin* (1913).
8. *James W. Collier* (1909).

MISSOURI

1. *M. A. Romjue* (1923).
2. *Ralph F. Lozier* (1923).
3. *Jacob L. Milligan* (1923).
4. *David Hopkins* (1929).
5. Edgar C. Ellis (1929).
6. T. J. Halsey (1929).
7. John W. Palmer (1929).
8. *William L. Nelson* (1925).
9. *Clarence Cannon* (1923).
10. H. F. Niedringhaus (1927.
11. *John J. Cochran* (1927).
12. Leonidas C. Dyer (1917).
13. Charles E. Kiefner (1929).
14. Dewey Short (1929).
15. Joe J. Manlove (1923).
16. R. L. Johnston (1929).

MONTANA

1. *John M. Evans* (1923).
2. Scott Leavitt (1923).

NEBRASKA

1. *John H. Moorehead* (1923).
2. Willis G. Sears (1923).
3. *Edgar Howard* (1923).
4. Charles H. Sloan (1929).
5. Fred G. Johnson (1929).
6. R. G. Simmons (1923).

NEVADA

At large—S. S. Arentz (1925).

NEW HAMPSHIRE

1. Fletcher Hale (1925).
2. Edward H. Watson (1915).

NEW JERSEY

1. C. A. Wolverton (1926).
2. Isaac Bacharach (1915).
3. Harold C. Hoffman (1927).
4. Charles A. Eaton (1925).
5. E. R. Ackerman (1919).
6. Randolph Perkins (1921).
7. George N. Seger (1923).
8. F. A. Hartley, Jr. (1929).
9. Franklin W. Fort (1925).
10. F. R. Lehlbach (1915).
11. *O. L. Auf der Heide* (1925).
12. *Mary T. Norton* (1925).

NEW MEXICO

At large—A. G. Simms (1929).

NEW YORK

1. Robert L. Bacon (1923).
2. *W. F. Brunner* (1929).
3. *George W. Lindsay* (1923).
4. *Thomas H. Cullen* (1919).
5. *L. M. Black, Jr.* (1923).
6. *Andrew L. Somers* (1925).
7. Vacant.
8. *Patrick J. Carley* (1927).
9. Vacant.
10. *Emanuel Celler* (1923).
11. *Anning S. Prall* (1923).
12. *Samuel Dickstein* (1923).
13. *C. D. Sullivan* (1917).
14. *W. I. Sirovich* (1927).
15. *John J. Boylan* (1923).
16. *J. J. O'Connor* (1923).
17. Ruth Pratt (1929).
18. *M. J. Kennedy* (1930).
19. *Sol Bloom* (1923).
20. *F. H. LaGuardia* (1923).
21. *J. A. Gavagan* (1929).
22. *Anthony J. Griffin* (1917).
23. *Frank Oliver* (1923).
24. *J. M. Fitzpatrick* (1926).
25. J. M. Wainwright (1923).
26. Hamilton Fish, Jr. (1920).
27. Harcourt J. Pratt (1925).
28. *Parker Corning* (1923).
29. James S. Parker (1913).
30. Frank Crowther (1919).
31. Bertrand H. Snell (1915).
32. Francis D. Culkin (1928).
33. F. M. Davenport (1925).
34. John D. Clarke (1921).
35. C. E. Hancock (1927).
36. John Taber (1923).
37. Gale H. Stalker (1923).
38. James L. Whitley (1929).
39. Archie D. Sanders (1917).
40. S. W. Dempsey (1915).
41. Edmund F. Cooke (1929).
42. *James M. Mead* (1919).
43. Daniel A. Reed (1919).

NORTH CAROLINA

1. *Lindsay C. Warren* (1925).
2. *John H. Kerr* (1923).
3. *C. L. Abernethy* (1922).
4. *Edward W. Pou* (1901).
5. *F. W. Hancock, Jr.* (1930).
6. *J. Bayard Clark* (1929).
7. *Hinton James* (1930).
8. *R. L. Doughton* (1911).
9. Charles A. Jonas (1929).
10. G. M. Pritchard (1929).

NORTH DAKOTA

1. O. B. Burtness (1921).
2. Thomas Hall (1924).
3. J. H. Sinclair (1919).

OHIO

1. Nicholas Longworth (1915).
2. William E. Hess (1929).
3. R. G. Fitzgerald (1921).
4. John L. Cable (1929).
5. C. J. Thompson (1919).
6. C. C. Kearns (1915).
7. Charles Brand (1923).
8. G. E. Mouser, Jr. (1929).
9. W. W. Chalmers (1925).
10. T. A. Jenkins (1925).
11. *M. G. Underwood* (1923).
12. John C. Speaks (1921).
13. Joe E. Baird (1929).
14. Francis Seiberling (1929).
15. C. Ellis Moore (1919).
16. C. B. McClintock (1929).
17. W. M. Morgan (1921).
18. Frank Murphy (1919).
19. John G. Cooper (1915).
20. *C. A. Mooney* (1923).
21. *Robert Crosser* (1923).
22. Chester C. Bolton (1929).

OKLAHOMA

1. Charles O'Connor (1929).
2. *W. W. Hastings* (1923).
3. *Wilburn Cartwright* (1927).
4. *T. D. McKeown* (1923).
5. U. S. Stone (1929).
6. *Jed Johnson* (1926).
7. *J. V. McClintic* (1915).
8. *M. C. Garber* (1923).

OREGON

1. Willis C. Hawley (1907).
2. Robert R. Butler (1928).
3. F. F. Korell (1927).

PENNSYLVANIA

1. James M. Beck (1927).
2. George S. Graham (1913).
3. Harry C. Ransley (1920).
4. B. M. Golder (1925).
5. J. J. Connolly (1921).
6. George A. Welsh (1923).
7. George P. Darrow (1915).
8. James Wolfenden (1928).
9. Henry W. Watson (1915).
10. J. R. Kinzer (1930).
11. L. H. Watres (1923).
12. C. M. Turpin (1929).
13. George F. Brumm (1929).
14. C. J. Esterly (1929).
15. L. T. McFadden (1915).
16. Robert F. Rich (1930).
17. F. W. Magrady (1925).
18. Edward M. Beers (1923).
19. Isaac H. Doutrich (1926).
20. J. Russell Leech (1927).
21. J. Banks Kurtz (1923).
22. Franklin Menges (1925).
23. J. Mitchell Chase (1927).
24. Samuel A. Kendall (1919).
25. Henry W. Temple (1915).
26. J. Howard Swick (1927).
27. Nathan J. Strong (1917).
28. T. C. Cochran (1926).
29. Milton W. Shreve (1919).
30. William R. Coyle (1929).
31. Adam M. Wyant (1921).
32. Edmund M. Erk (1930).
33. Clyde Kelly (1917).
34. Patrick J. Sullivan (1929).
35. Harry A. Estep (1927).
36. Guy E. Campbell (1917).

RHODE ISLAND

1. Clark Burdick (1919).
2. Richard S. Aldrich (1923).
3. *Francis B. Condon* (1930).

SOUTH CAROLINA

1. *T. S. McMillan* (1925).
2. *Butler B. Hare* (1925).
3. *Fred H. Dominick* (1917).
4. *John J. McSwain* (1921).
5. *W. F. Stevenson* (1917).
6. *Allard H. Gasque* (1928).
7. *H. P. Fulmer* (1921).

SOUTH DAKOTA

1. C. A. Christopherson (1919).
2. Royal C. Johnson (1915).
3. William Williamson (1921).

TENNESSEE

1. B. Carroll Reece (1921).
2. J. Will Taylor (1919).
3. *S. D. McReynolds* (1923).
4. *Cordell Hull* (1923).
5. *Ewin L. Davis* (1919).
6. *Joseph W. Byrns* (1909).
7. *Edward E. Eslick* (1925).
8. *Gordon Browning* (1923).
9. *Jere Cooper* (1929).
10. *Hubert F. Fisher* (1917).

TEXAS

1. *Wright Patman* (1929).
2. *John C. Box* (1919).
3. *Morgan G. Sanders* (1921).
4. *Sam Rayburn* (1913).
5. *H. S. Sumners* (1913).
6. *Luther A. Johnson* (1923).
7. *Clay Stone Briggs* (1919).
8. *Daniel E. Garrett* (1921).
9. *J. J. Mansfield* (1917).
10. *J. P. Buchanan* (1913).
11. *O. H. Cross* (1929).
12. *Fritz G. Lanham* (1919).
13. *Guinn Williams* (1923)
14. H. M. Wurzbach (1920).
15. *John N. Garner* (1903).
16. *C. D. Hudspeth* (1919).
17. *T. L. Blanton* (1916).
18. *Marvin Jones* (1917).

UTAH

1. Don B. Colton (1921).
2. F. C. Loofbourow (1930).

VERMONT

1. Elbert S. Brigham (1925).
2. Ernest W. Gibson (1923).

VIRGINIA

1. *Schuyler O. Bland* (1918).
2. Menaleus Lankford (1929).
3. *A. J. Montague* (1913).
4. *Patrick H. Drewry* (1920).
5. *Joseph Whitehead* (1925).
6. *C. A. Woodrum* (1923).
7. Jacob A. Garber (1929).
8. *R. Walton Moore* (1919).
9. Joseph C. Shaffer (1929).
10. *Henry St. G. Tucker* (1923).

WASHINGTON

1. John F. Miller (1917).
2. Lindley H. Hadley (1915).
3. Albert Johnson (1913).
4. John W. Summers (1919).
5. *Samuel B. Hill* (1923).

WEST VIRGINIA

1. Carl G. Bachmann (1925).
2. Frank L. Bowman (1925).
3. John M. Wolverton (1929).
4. Robert L. Hogg (1930).
5. Hugh Ike Shott (1929).
6. *Joe L. Smith* (1929).

WISCONSIN

1. Henry A. Cooper (1921).
2. Charles A. Kading (1927).
3. John M. Nelson (1921).
4. John C. Schafer (1923).
5. W. H. Stafford (1929).
6. *Michael K. Reilly* (1913).
7. Merlin Hull (1928).
8. E. E. Browne (1913).
9. G. J. Schneider (1923).
10. James A. Frear (1913).
11. Hubert H. Peavy (1923).

WYOMING

At large—Vincent Carter (1929).

ALASKA

Dan A. Sutherland (1921).

HAWAII

V. S. K. Houston (1927).

PHILIPPINE ISLANDS

1. Pedro Guevara (1923).
2. Camilo Osias (1929).

PORTO RICO

Felix Cordova Davila (1917).

PERSONNEL OF THE ADMINISTRATION

BY MILTON CONOVER

ASSOCIATE PROFESSOR, YALE UNIVERSITY

THE CABINET

Secretary of Labor Doak.—The personnel of the Cabinet as reported in THE AMERICAN YEAR BOOK, 1929, (pp. 67-70) remained unchanged until January, 1931, excepting in the Secretaryship of Labor from which James J. Davis resigned after his election to the United States Senate from Pennsylvania in November, 1930. Mr. Davis entered the Cabinet on March 5, 1921, and served continuously under Presidents Harding, Coolidge and Hoover. He was succeeded by William Nuckles Doak of Virginia, who is the first American-born citizen to serve as Secretary of Labor since the Department was created in 1913, Mr. Davis being a native of Wales, and William B. Wilson, the first Secretary of Labor, being a native of Scotland. Mr. Doak was born in old Wythe County, Virginia, in 1882, and he has been general chairman of the Brotherhood of Railroad Trainmen of the Norfolk and Western System and editor of *The Railroad Trainmen.* He is a Southern Republican, a Mason and an Elk

Assistant Secretaryships. — There was one appointment, Francis White being made fourth Assistant Secretary of State. He is a native of Maryland, a graduate of Yale, has studied at the *Ecole Libre des Sciences Politiques* at Paris, the University of Madrid, and has had fourteen years' service under the State Department.

THE BUREAUS

In January, 1931, there still remained one vacancy in the directorship of bureaus, that one being in the Office of Experiment Stations which had been filled by Dr. E. W. Allen since 1915. Other changes involved the promotion of David Burnet from Deputy Commissioner of Internal Revenue to Commissioner, *vice* Robert H. Lucas. After the Bureau of Prohibition was transferred from the Treasury Department to the Department of Justice, Capt. Amos W. W. Woodcock of Maryland was made Commissioner in place of Dr. James M. Doran who became Commissioner of the Bureau of Industrial Alcohol in the Department of Treasury. To be Commissioner of the recently created Bureau of Narcotics was appointed H. J. Anslinger. In the War Department, Gen. Douglass McArthur was appointed Chief of Staff to succeed Gen Charles P. Summerall.

COMMISSIONERS AND INDEPENDENT ESTABLISHMENTS

Civil Service Commission.—According to data personally given out at the White House in January one of the major changes in personnel of the past year affecting the independent establishments was that occurring in the Civil Service Commission on July 7, 1930, when William Chapin Deming of Wyoming resigned as Commissioner to become a candidate for the United States Senate. Mr. Deming had been president of the Commission since March 31, 1923, and had distinguished himself as an author of American biography as well as a personnel administrator. President Hoover wrote to him that he was "in high hopes that the time may come when your personal affairs will permit of your return to public service." Mr. Deming was succeeded by former Governor Thomas E. Campbell of Arizona, author of a book, *Centralized Authority in Taxation.* In his first annual report (Oct. 28, 1930) he reviewed the suggestions made in former reports with a view to legislation providing for the placing of "field presidential positions which are non-policy determining, such as collectors of internal revenue and customs, and postmasters, in the classified service, dispensing with confirmation by the Senate and the four-year term of office, leaving to the President his discretionary power of making such rules and exceptions as he may deem necessary." This was in harmony with President Hoover's recommendation that even third-class postmasters be placed in the classified merit system.

The Interstate Commerce Commission suffered the resignation of Johnston B. Campbell of Washington, who had joined the organization in 1921 and had served as its chairman. He was succeeded as chairman by Frank McManany, who had been his colleague in the Commission. His successor in the Commission is William E. Lee of Idaho. Other changes were the appointments of Hugh M. Tate of Tennessee, *vice* Richard V. Taylor, resigned, and Charles D. Mahaffie of the District of Columbia to succeed Thomas F. Woodlock, likewise resigned.

The Federal Reserve Board was enhanced by the appointment of Eugene Meyer, Jr., of New York, a graduate of Yale who had studied abroad two years, and had been in government service almost continuously since 1917, including service on the War Finance Corporation.

United States Tariff Commission became an entire new agency, but three of the members of the former Commission joined the new body. They were Alfred P. Dennis of Maryland, who had been the vice-chairman; Lincoln Dixon of Indiana, and Edgar B. Brossard of Utah. The president of the new Commission is Henry P. Fletcher of Pennsylvania, who has had long service in the Diplomatic Service and has been the Under Secretary of State. The vice-chairman is Thomas Walker Page, of Virginia, a Ph.D. of the University of Leipzig, Germany, a former student of Oxford and of Paris, with nearly twenty years' experience as a college professor of economics. He had been a member of the Tariff Board under President Wilson in 1911-12, and of the Tariff Commission in 1918-22, a part of which term he was chairman. The secretary is Sidney Morgan. President John Lee Coulter of North Dakota Agricultural College, was added to the Commission. He is a Ph.D. in Economics of the University of Wisconsin, and has had about twenty years' experience as a professor of economics and is the author of noted books in his subject.

Federal Power Commission.—Perhaps the major change in administration personnel during the year was that of the Federal Power Commission. By the Act of June 23, 1930, an entirely new Water Power Commission is created in place of that organized under the Water Power Act of 1920 and which composed the Commission of the Secretaries of War, Interior, and Agriculture, along with assisting personnel and with technical aid drawn from the three departments represented in the body. The Act of 1930 constitutes the new Commission with five full-time administrators appointed by the President with the advice and consent of the Senate. Eventually their terms shall be five years. In December, 1930, the Senate confirmed the appointment of Dr. George Otis Smith of Maine, a graduate of Colby College and a Ph.D. of Johns Hopkins, who had served about twenty years as director of the U. S. Geological Survey and had published numerous works on economics and natural resources. His colleagues are Frank R. McNinch of North Carolina, Marcel Garsaud of Louisiana, Ralph B. Williamson of Washington, Claude L. Draper of Wyoming.

GOVERNMENT EMPLOYEES

Enumeration.—In 1930, the total number of civil servants of the National Administration was 608,915 as compared with 587,665 in 1929, an increase of 21,250 persons. Of these employees, 68,510 were employed in the District of Columbia while the remaining 540,405 were employed elsewhere. The number of women employed in 1930 was 88,856 as compared with 82,501 in 1929. The positions in the District alone attracted 28,162 women, while 60,694 found places outside Washington. These positions included not only the ordinary clerical and stenographic work, but also such positions as telegraph operator, inspector of customs, immigrant inspector, mechanical draftsmen, observer in meteorology, library assistant, and dental hygienist.

Classification.—The merit system as a policy has developed so rapidly that on Oct 28, 1930, the total number of positions subject to competitive examination under the National Civil Service Act was 462,083. This represented a gain during the year of 16,126 positions. The Civil Service Commissioner reported that the "Postal Service, with 316,995 employees, represents 52.06 per cent, and the remaining services with 291,920 employees, 47.94 per cent of the entire personnel. The Postal Service had a net increase of 2,200 employees, while the other services had a net increase of 19,050 during the past year." Great gains were repeated in other departments, thus: The Department of Commerce, 10,211; the War Department, 3,022; the Panama Canal, 2,602; the Interior Department, 2,001; the Department of Agriculture, 1,741. The remaining gain of 2,795 employees was distributed among the other services. A few establishments show a slight decrease. Of the total decrease of 3,322 during the fiscal year, the Navy Department made the greatest reduction in personnel, the total being 2,879. This later reduction apparently was the result of the disarmament conferences and the general movements for peace. About 3,000 employees were continued beyond their retirement age as compared with 2,903 of the previous year.

Political Charges.—Political activity on the part of the classified employees seems to have been reduced to a negligible amount. In 1930 the Civil Service Commission took action in only 91 instances—that number being 48 fewer than in the preceding year. These cases resulted in the suspension or reduction in salary of eight employees, and in caution or reprimand of 33. In 25 cases the charges were not sustained. Other recommendations affected a few other employees charged with political activity. The nature of the political work by employees as investigated by the Commission were: electioneering, influencing voters by the use of money, becoming a candidate for elective office, soliciting support for political candidates, holding office in a political organization, participation in political conventions, and miscellaneous minor offences.

FEDERAL ADMINISTRATIVE ORGANIZATION

By William M. Schuyler

Associate Editor, The American Year Book

THE PRESIDENT AND VICE-PRESIDENT

President.—Herbert Hoover, of California (Republican). Sworn into office as President of the United States, March 4, 1929, in succession to Calvin Coolidge.

Vice-President.—Charles Curtis of Kansas (Republican). Inaugurated Vice-President of the United States, March 4, 1929.

Secretaries to the President.—George Akerson (Minnesota); Lawrence Richey (Pennsylvania); Walter Hughes Newton (Minnesota).

Presidential Vacancy.—By Act of

Congress, in the case of vacancy occurring in the office of President through the death or removal of both the President and Vice-President, the Cabinet officers succeed to the Presidency in the order indicated in the arrangement of the following summary of the executive departments:

DEPARTMENT OF STATE

Secretary of State.—Henry Lewis Stimson.

Undersecretary of State.—Joseph P. Cotton.

Assistant Secretaries of State.—Wilbur J. Carr, William R. Castle, Jr., Francis White.

Foreign Service Personnel Board.—Wilbur J. Carr, Assistant Secretary of State, chairman; William R. Castle, Jr., Assistant Secretary of State.

Solicitor.—Green H. Hackworth.

Economic Adviser. — Frederick Livesey (Acting).

Chief Clerk and Administrative Assistant.—E. J. Ayers.

Assistant to the Secretary of State.—William H. Beck.

Chief of Divisions.—

Far Eastern Affairs—Stanley K. Hornbeck.
Latin-American Affairs. — Walter C. Thurston (Acting).
Western European Affairs .— J. Theodore Marriner.
Near Eastern Affairs.—Wallace S. Murray.
Mexican Affairs. — Herschel V. Johnson.
Eastern European Affairs.—Robert F. Kelley.
Passport.—Ruth B. Shipley.
Current Information.—Michael J. McDermott.
Foreign Service Administration.—Herbert C. Hengstler.
International Conferences and Protocol.—Richard Southgate (Acting).
Treaty.—Charles M. Barnes.
Foreign Service Personnel.—Homer M. Byington.

Chiefs of Bureaus.—

Accounts.—William McNeir.
Indexes and Archives.—David A. Salmon.
Translating.—Emerson B. Christie.

Chief of Offices.—

Consular Commercial.—John G. Erhardt (in charge).
Historical Advisor.—Tyler Dennett.
Coordination and Review.—Margaret M. Hanna.
Visa.—Anderson Dana Hodgdon.
Foreign Service Buildings.—Keith Merrill.
Foreign Service School.—James B. Stewart.

Editor of Laws of Congress.—Vacant.

Disbursing Officer. — W. Ford Cramer.

DEPARTMENT OF THE TREASURY

Secretary of the Treasury.—Andrew W. Mellon.

Charged with the management of the national finances. He prepares plans for the improvement of the revenue and support of the public credit; superintends collection of the moneys paid from and into the Treasury; controls construction of public buildings, coinage and printing of money, and the administration of the Coast Guard and the Public Health Service; ex-officio chairman of the Federal Reserve Board and of the Federal Farm Loan Board.

Undersecretary of the Treasury.—Ogden L. Mills.

Assistant Secretary in Charge of Fiscal Offices.—Walter E. Hope.

Assistant Secretary in Charge of Public Buildings, Public Health and Miscellaneous.—Ferry K. Heath.

Assistant Secretary in Charge of Customs, Coast Guard, Industrial Alcohol and Narcotics.—Seymour Lowman.

Assistant to the Secretary.—John Kieley.

Chief Clerk and Superintendent.—F. A. Birgfeld.

Commissioner of the Public Debt.—William S. Broughton.

Commissioner of Accounts and Deposits.—Robert G. Hand.

Chief of Divisions.—

Appointments.—James E. Harper.
Bookkeeping and Warrants.—E. F. Barteit.
Deposits.—E. D. Batchelder.

Loans and Currency.—Marvin Wesley.

Paper Custody.—M. A. Emerson.

Public Debt Accounts and Audit.—M. R. Loafman.

Secret Service.—W. H. Moran.

Supply.—L. C. Spangler.

Section of Financial and Economic Research.—W. R. Stark.

Disbursing Clerk.—J. L. Summers.

Government Actuary.—Joseph S. McCoy.

Comptroller of the Currency.—J. W. Pole.

Has supervision of the national banks, their examination and reports; preparation and issue of national bank circulation; redemption and destruction of national bank notes. Ex-officio member of the Federal Reserve Board in which capacity he draws a salary of $7,000 in addition to the salary of $5,000 attached to the office proper of Comptroller of the Currency.

Treasurer of the United States.—W. O. Woods.

Charged with the receipts and disbursement of all public moneys deposited in the Treasury and Sub-Treasuries and in national bank depositaries.

Director of the Bureau of the Budget.—J. Clawson Roop.

Commissioner of the Bureau of Customs.—F. X. A. Eble.

Commissioner of the Bureau of Internal Revenue.—David Burnet.

Charged with general supervision of the collection of all internal revenue taxes, including the income tax, and the enforcement of internal revenue laws.

Director of the Bureau of the Mint.—Robert J. Grant.

Has general supervision of the mints and assay offices.

Commissioner of Industrial Alcohol.—J. M. Doran.

Commissioner of Narcotics.—H. J. Anslinger.

Register of the Treasury.—Edward E. Jones.

Federal Farm Loan Bureau.—Andrew W. Mellon, Secretary of the Treasury, chairman ex-officio; Paul Bestor, Farm Loan Commissioner; John H. Guill, Lewis J. Pettijohn, Albert C. Williams, George R. Cooksey, Floyd R. Harrison.

Director of the Bureau of Engraving and Printing.—Alvin W. Hall.

Produces all the securities and similar work of the Government printed from steel plates.

Bureau of the Public Health Service.—Hugh S. Cumming, Surgeon General.

Charged with the framing and enforcement of regulations for the prevention of the introduction and spread of contagious disease; supervision of the quarantine service of the United States, and supervision of the marine hospitals.

Coast Guard. — Rear Admiral Frederick C. Billard, Commandant.

Office of the Supervising Architect.—James A. Wetmore, Acting Supervising Architect.

Custom House.—Charles R. Lewis, Deputy Collector in Charge.

DEPARTMENT OF WAR

Secretary of War.—Patrick J. Hurley.

The Assistant Secretary of War.—Frederick H. Payne.

Assistant Secretary of War.—F. Turbee Davison.

Assistant and Chief Clerk.—John C. Schofield.

Executive Assistant to the Secretary of War.—John W. Martyn.

Clerk to the Secretary of War.—John W. Schott.

War Department General Staff.—General Douglas MacArthur, Chief of Staff; Major General Ewing E. Booth, Deputy Chief of Staff.

Office of the Chief Cavalry.—Major General Guy V. Henry, Chief.

Chief of Field Artillery.—Major General Harry G. Bishop.

Chief of Coast Artillery.—Major General John W. Gulick.

Chief of Infantry.—Major General Stephen O. Fuqua.

Chief of Chaplains.—Julian E. Yates.

The Adjutant General.—Major General Charles H. Bridges.

The Inspector General.—Major General H. A. Drum.

The Judge Advocate General.—Major General Edward A. Kreger.

The Quartermaster General.—Major General J. L. DeWitt.

Chief of Finance.—Major General Roderick L. Carmichael.

Surgeon General.—Major General M. W. Ireland.

Chief of Engineers.—Major General Lytle Brown.

Chief of Ordnance.—Major General Samuel Hof.

Chief Signal Officer.—Major General George S. Gibbs.

Chief of the Air Corps.—Major General J. E. Fechet.

Chief of the Bureau of Insular Affairs.—Brigadier General Francis LeJau Parker.

Philipine Government. — Dwight F. Davis, Governor-General.

Porto Rico Government.—Theodore Roosevelt, Governor.

Chief of the Militia Bureau.—Major General William G. Everson.

Chief of the Chemical Warfare Service.—Major General Harry L. Gilchrist.

The Army War College.—Major General William D. Connor, Commandant.

DEPARTMENT OF JUSTICE

Attorney General.—William DeWitt Mitchell.

Represents the United States in all legal matters.

Solicitor General.—Thomas Day Thacher.

Assistant to the Attorney General.—John Lord O'Brian.

Assistant Attorneys General.—Seth W. Richardson, Charles P. Sisson, G. Aaron Youngquist, Charles B. Rugg, Charles D. Lawrence (Division of Customs).

Director of the Bureau of Investigation.—J. Edgar Hoover.

Private Secretary and Assistant to the Attorney General.—Ugo J. A. Carusi.

Administrative Assistant.—Charles E. Stewart.

General Agent and Acting Chief Clerk.—John W. Gardner.

Assistant Chief Clerk and Appointment Clerk.—Charles B. Sornborger.

Chief of the Division of Mails and Files.—Arthur Robb.

Chief of the Division of Supplies and Printing.—Edward N. Bodholdt.

Librarian.—George Kearney.

Director of the Bureau of Prisons.—Sanford Bates.

Attorney in Charge of Pardons.—James A. Finch.

Disbursing Clerk.—Raymond D. Allison.

Director of the Bureau of Prohibition.—Amos W. W. Woodcock.

POST OFFICE DEPARTMENT

Postmaster General.—Walter F. Brown.

Secretary to the Postmaster General.—Kenneth Macpherson.

First Assistant Postmaster General.—Arch Coleman.

Second Assistant Postmaster General.—Warren Irving Glover.

Third Assistant Postmaster General.—Frederic A. Tilton.

Fourth Assistant Postmaster General.—John W. Philp.

Comptroller.—William E. Buffington.

Director of Parcel Post.—Aaron W. Watts.

Solicitor.—Horace J. Donnelly.

Chief Post Office Inspector.—Vacant.

DEPARTMENT OF THE NAVY

Secretary of the Navy.—Charles Francis Adams.

The Assistant Secretary of the Navy.—Ernest Lee Jahncke.

Assistant Secretary of the Navy (Air).—David S. Ingalls.

Chief Clerk.—F. S. Curtis.

Private Secretary to the Secretary.—Alexander J. Doyle.

Chief of Appointment Division.—William D. Bergman.

Disbursing Clerk.—A. H. Hoiland.

Chief of Division of Records.—Charles T. Ogle.

Budget Officer.— Rear Admiral Ridley McLean.

Island Governments.—

Guam.—Commander Willis W. Bradley, Jr., Governor.

American Samoa—Captain Gatewood S. Lincoln, Governor.

Virgin Islands—Captain Waldo Evans (retired), Governor.

Chief of Naval Operations.—Admiral William V. Pratt.

Chief of the Bureau of Navigation.—Rear Admiral F. B. Upham.

Chief of the Bureau of Yards and Docks.—Rear Admiral A. L. Parsons.

Chief of the Bureau of Ordnance.—Rear Admiral William D. Leahy.

Chief of the Bureau of Construction and Repair.—Rear Admiral George H. Rock.

Chief of the Bureau of Engineering.—Rear Admiral Harry E. Yarnell.

Chief of the Bureau of Supplies and Accounts. — Rear Admiral Joseph Johnston Cheatham.

Chief of the Bureau of Medicine and Surgery.—Rear Admiral Charles E. Riggs.

Chief of the Bureau of Aeronatics.—Rear Admiral William A. Moffett.

Judge Advocate General.—Rear Admiral David F. Sellers.

Naval Consulting Board.—Thomas A. Edison, President; William L. Saunders, Chairman.

Compensation Board.—Rear Admiral W. L. Capps (retired), senior member.

General Board.—Admiral W. V. Pratt, Rear Admirals Mark L. Bristol, G. C. Day, J. R. Y. Blakely, Harris Laning, Henry V. Butler, A. St. C. Smith; Major General B. H. Fuller, Captain Harry Baldridge, Lieutenant Colonel L. C. Lucas, Commander Edgar M. Williams.

President of the Board of Medical Examiners.—Rear Admiral Robert M. Kennedy.

President of the Naval Examining Board.—Captain Hilary H. Royall.

President of the Naval Retiring Board.—Rear Admiral Robert M. Kennedy.

Naval Dispensary. — Captain Charles M. Oman.

Navy Yard and Station, Washington, D. C.—Captain C. C. Bloch, Commandant.

Naval Medical School.—Captain Charles S. Butler.

Navy Hospital.—Captain Theodore W. Richards.

Attendance on Officers. — Commander John J. O'Malley.

President of the Board for Examination of Medical Officers.—Captain Charles S. Butler.

President of the Board for Examination of Dental Officers.—Captain Charles S. Butler.

Headquarters Marine Corps. — Major General Ben H. Fuller, Commandant; Brigadier General Rufus H. Lane, Adjutant and Inspector; Brigadier General Hugh Matthews, Quartermaster; Brigadier General George Richards, Paymaster.

Marine Barracks.—Colonel Rush R. Wallace, commanding.

DEPARTMENT OF THE INTERIOR

Secretary of the Interior.—Ray Lyman Wilbur.

Charged with pensions, public lands, Indian affairs, geological surveys, reclamation of arid lands, and mines.

First Assistant Secretary.—Joseph M. Dixon.

Assistant Secretary.—John H. Edwards.

Administrative Assistant.—Ebert K. Burlew.

Chief Clerk.—W. Bertrand Acker.

Solicitor.—Edward C. Finney.

Board of Appeals.—George B. Gardner, William B. Newman, Alvah W. Patterson.

Supervisor of Classification. — John Harvey.

Commissioner of the General Land Office.—Charles C. Moore.

Commissioner of the Bureau of Indian Affairs.—Charles J. Rhoads.

Commissioner of the Office of Education.—William John Cooper.

Director of the Geological Survey.—George Otis Smith.

Commissioner of the Bureau of Reclamation.—Elwood Mead.

Director of the National Park Service.—Horace M. Albright.

Board of Indian Commissioners.—Samuel A. Eliot, Chairman.

Southern Appalachian National Park Commission.—Henry W. Temple, Chairman.

Territorial Officials.—

Alaska.—George A. Parks, Governor.

Hawaii.—Lawrence M. Judd, Governor.

The Alaska Railroad.—Otto H. Ohlson, General Manager.

DEPARTMENT OF AGRICULTURE

Secretary of Agriculture.—Arthur Mastick Hyde.

Assistant Secretary.—R. W. Dunlap.

Assistant to the Secretary.—E. N. Meador.

Director of Scientific Work.—A. F. Woods.

Director of Regulatory Work.—Walter G. Campbell.

Director of Extension Work.—C. W. Warburton.

Director of Personnel and Business Administration.—W. W. Stockberger.

Director of Information.—Milton S. Eisenhower.

Solicitor.—Elton L. Marshall.

Librarian.—Claribel R. Barnett.

Office of Experiment Stations.—Vacant.

Weather Bureau.—Charles F. Marvin, Chief.

Bureau of Animal Industry.—John R. Mohler, Chief.

Bureau of Dairy Industry.—O. E. Reed, Chief.

Bureau of Plant Industry.—William A. Taylor, Chief.

Forest Service.—R. Y. Stuart, Forester and Chief.

Bureau of Chemistry and Soils.—Henry G. Knight, Chief.

Bureau of Entomology.—C. L. Marlatt, Chief.

Bureau of Biological Survey.—Paul G. Redington, Chief.

Bureau of Public Roads. — Thomas H. MacDonald, Chief.

Bureau of Agricultural Economics.—Nils A. Olsen.

Bureau of Home Economics.—Louise Stanley, Chief.

Plant Quarantine and Control Administration. — Lee. A. Strong, Chief.

Grain Futures Administration.—J. W. T. Duvel, Chief.

Food and Drug Administration.—W. G. Campbell, in charge.

DEPARTMENT OF COMMERCE

Secretary of Commerce.—Robert Patterson Lamont.

Assistant Secretary. — Julius Klein.

Assistant Secretary for Aeronautics.—Clarence M. Young.

Administrative Assistant to the Secretary.—Malcolm Kerlin.

Statistical Assistant to the Secretary.—E. Dana Durand.

Solicitor.—Ephraim F. Morgan.

Chief Clerk and Superintendent.—E. W. Libbey.

Disbursing Clerk. — Charles E. Molster.

Chiefs of Divisions.—

Appointments.—Edw. J. Gardner.

Publications.—Thomas F. McKeon.

Supplies.—Walter S. Erwin.

Librarian.—Anne G. Cross.

Director of Air Regulation.—Gilbert G. Budwig.

Director of the Radio Division.—William D. Terrell.

Director of the Bureau of the Census.—William M. Steuart.

Director of the Bureau of Foreign and Domestic Commerce.—William L. Cooper.

Director of the Bureau of Standards.—George K. Burgess.

Commissioner of the Bureau of Fisheries.—Henry O. Malley.

Commissioner of the Bureau of Lighthouses.—George R. Putnam.

Director of the Coast and Geodetic Survey.—R. S. Patton.

Commissioner of the Bureau of Navigation.—Arthur J. Tyrer.

Steamboat Inspection Service.—Dickerson N. Hoover, supervising inspector general.

Commissioner of the Patent Office.—Thomas E. Robertson.

Director of the Bureau of Mines.—Scott Turner.

DEPARTMENT OF LABOR

Secretary of Labor.—William N. Doak.

Charged with the duty of fostering, promoting and developing the welfare of the wage earners of the United

States and also working towards a solution of the labor problems.

The Assistant Secretary.—Robe Carl White.

Second Assistant Secretary.—W. W. Husband.

Assistants to the Secretary. — Peter F. Snyder and W. N. Smelser.

Solicitor.—Theodore G. Risley.

Chief Clerk.—Samuel J. Gompers.

Disbursing Clerk.—John R. Demorest.

Director of Conciliation.—Hugh L. Kerwin.

Commissioner of Labor Statistics.—Ethelbert Stewart.

Commissioner General of Immigration.—Harry E. Hull.

Chief of the Children's Bureau.—Grace Abbott.

Commissioner of Naturalization.—Raymond F. Crist.

Director of the Women's Bureau.—Mary Anderson.

United States Employement Service.—Frances I. Jones, Director General.

Bureau of Industrial Housing and Transportation.—Lulah T. Andrews.

MISCELLANEOUS EXECUTIVE SERVICES

Civil Service Commission. — Thomas E. Campbell, president; George R. Wales, Jessie Dell.

Interstate Commerce Commission.—Frank McManamy, chairman; Balthasar H. Meyer, Clyde B. Aitchison, Joseph B. Eastman, Ernest L. Lewis, Ezra Brainerd, Jr., Claude R. Porter, Patrick J. Farrell, William E. Lee, Hugh M. Tate, Charles D. Mahaffie.

United States Bureau of Efficiency.—Herbert D. Brown, Chief.

United States Employees' Compensation Commission. — Bessie Parker-Brueggeman, chairman; Harry Bassett, John M. Morin.

General Accounting Office.—J. R. McCarl, Comptroller General of the United States.

United States Railroad Administration.—Andrew Mellon, Secretary of the Treasury, Director General.

Federal Reserve Board.—Andrew W. Mellon, Chairman; Eugene Meyer, Governor; Adolph C. Miller, Charles S. Hamlin, Edward H. Cunningham, George R. James.

Federal Trade Commission. — Garland S. Ferguson, Jr., Chairman; C. W. Hunt, William E. Humphrey, Charles H. March, Edgar A. McCulloch, Otis B. Johnson, Secretary.

United States Tariff Commission.—Henry P. Fletcher, Chairman; Thomas Walker Page, Vice-Chairman; John Lee Coulter, Edgar B. Brossard, Alfred P. Dennis, Lincoln Dixon, Commissioners; Sidney Morgan, Secretary.

United States Board of Tax Appeals.—Logan Morris, Chairman.

Federal Farm Board.—Alexander Legge, Chairman.

Federal Power Commission.—Patrick J. Hurley, Secretary of War; Ray L. Wilbur, Secretary of the Interior; Arthur M. Hyde, Secretary of Agriculture; F. E. Bonner, Executive Secretary.

Federal Oil Conservation Board.—The Secretary of the Interior, Chairman; the Secretary of War, the Secretary of the Navy, the Secretary of Commerce.

Federal Radio Commission. — Charles McK. Saltzman, Chairman.

Veterans' Administration.—Brigadier General Frank T. Hines, Administrator; George E. Ijams, Director of the United States Veterans' Bureau; Edward W. Morgan, Acting Commissioner and Deputy Commissioner of the Bureau of Pensions; Colonel C. W. Wadsworth, Director of the Bureau of National Homes.

Federal Board for Vocational Education.—J. C. Wright, Director.

United States Board of Mediation.—Samuel E. Winslow, Chairman.

United States Shipping Board.—T. V. O'Connor, Chairman.

National Advisory Committee for Aeronautics. — Joseph S. Ames, Chairman.

Alien Property Custodian.—Howard Southerland.

Board of Surveys and Maps of the Federal Government.—Lieutenant Colonel R. R. Ralston, Chairman.

The Commission of Fine Arts.—Charles Moore, Chairman.

National Memorial Commission.—Ferdinand D. Lee, Chairman.

Smithsonian Institution.—Established 1846 under the terms of the will of James Smithson for the "increase and diffusion of knowledge among men." The former aim is accomplished by the promoting of original, scientific research, and the latter by publications and lectures. The affairs of the Institution are managed by a Board of Regents which coöperates with the Government and with National scientific bodies. Under the direction of the Institution are the National Museum, charged with preserving and utilizing objects of art and ethnological, geological and mineralogical collections belonging to the United States; Bureau of American Ethnology, National Gallery of Art, Freer Gallery of Art, National Zoological Park, Astrophysical Observatory, and the Regional Bureau for the United States International Catalogue of Scientic Literatures.

Secretary.—C. G. Abbott.

National Academy of Sciences.—Thomas H. Morgan, President; David White, Home Secretary; R. A. Millikan, Foreign Secretary. George K. Burgess, Chairman of the National Research Council.

Pan-American Union.—L. S. Rowe, Director General.

United States Geographic Board.—Frank Bond, Chairman.

American National Red Cross.—John Barton Payne, Chairman.

National Commission on Law Observance and Enforcement. —George W. Wickersham, Chairman.

FEDERAL CIVIL SERVICE

By Clinton Rogers Woodruff

Honorary Secretary, National Municipal League

INCREASE IN THE SERVICE

Employees.—An increase of 21,260 employees in the competitive service of the Federal Government on June 30, 1930, over the number employed a year previously was shown by statistics made public by the United States Civil Service Commission. These figures show that the number of employees has been gradually increasing since the reductions which followed the end of the world war. In 1923 there were 548,531 employees under the Commission's jurisdiction; in 1925 there were 564,718; in 1927 the number had again fallen to 559,138; but during the last three years the total has increased to 608,915. The Post Office Department, with some 317,000, is the largest employer; the Treasury Department next with 52,900; then the War and Navy Departments. The Veterans' Bureau and the Departments of Commerce and Agriculture rank next. The greatest increases in recent years have been made by the Departments of Commerce and Agriculture and the Panama Canal administration. Natural expansion (with the aviation activities of the Post Office Department given as an example) is offered by *The New York Times* as the principal cause of the increase.

Employment Recruiting.—How the Civil Service Commission fills these 21,360 new positions and the many thousand others made vacant each year by death, resignation, retirement and removal was recently explained by the Commission's director of recruiting, Herbert E. Morgan. The Commission relies partly on notices posted in some 5,000 first and second class post offices, public libraries and educational institutions, and on advertisements in newspapers and periodicals; but in special cases announcements are sent to technical schools and colleges and organizations of members of the profession in which the vacancy occurs. The use of radio in recruiting is the latest development in the Commission's publicity department. Broadcasts are made each week from some sixty stations.

THE UNITED STATES BUREAU OF EFFICIENCY

Staff.—This bureau (see AMERICAN YEAR BOOK, 1929) was organized under the act of Congress approved Feb. 28, 1916. The permanent staff on July 1, 1930, consisted of the Chief, the Assistant Chief, 25 investigators, 4 scientists, 12 clerks, 3 messengers, and 1 assistant scientific aid, a total of 47 employees, or 7 less than a year previously. The trained personnel includes experts in accountancy, in administrative audit, in statistics, in industrial engineering, in chemistry, in labor-saving devices, and in office management. It is the business of these experts to bring about better business methods and to reduce costs in the Government service.

Functions.—The functions of the bureau are to investigate the methods of business in the Government service; to investigate the needs of the executive departments and independent establishments with respect to personnel, and to establish and maintain a standard system of efficiency ratings for the classified civil service in the District of Columbia. The duties and powers of the Bureau with reference to investigations in the executive departments and independent establishments were extended to the municipal government of the District of Columbia by an act of Congress approved May 16, 1928. An index of all major activities of the Government is maintained by the Bureau. This index covers the activities of the Government from 1913 to date. It is used as a means to prevent duplication of work in the Government service and as a means to furnish information to Government officials and others regarding the activities of the executive departments and independent establishments.

THE MERIT SYSTEM

Tests.—The merit system of appointment in the Federal, state and municipal services is promoting efficiency and economy of administration and keeping pace with governmental needs in what is regarded on the whole as a satisfactory rate. The tests for appointment extend not merely to mental fitness but, so far as appropriate, to the duties of the positions to be filled, to physical qualification. Searching tests of character and oral interviews are also required for law-enforcement positions. The practicability and usefulness of these forms of test are now generally accepted both in government and industry and are considered part of management. They are of especial value and importance in higher technical, professional and scientific positions.

Selection.—Personnel work extends to the selection for employment training, by which is meant development both of the individual and the group, and research and planning. The filling of higher positions by promotion gives significance to original selections. Planning and research are intended to discover inefficient methods, obsolete usages and wrong conditions. They require special studies and job analyses. In the classified Federal service, embracing about 440,000 positions, effort is made to outline more or less definite careers in which employees, actual and prospective, may find avenues for their abilities and ambitions. This work is coördinated with schools and industries. It involves the study of a selected number of positions with regard to their actual duties and of opportunities for employment in or promotion to these positions.

Coöperative Tests.—The tests are shared with industries to ascertain industrial standards of selection and to effect improvement of the Government's methods. They are also shared with schools to develop coöperative relations in research and student guidance, and to afford comparison of the results of general intelligence tests in Federal examinations with the tests used in schools and colleges. A guidance card thus becomes practicable by which the applicant may become informed of opportunities related to his qualifications, the positions listed being accompanied by sample tests showing the nature of the examinations.

Follow-up Studies.—Employees are kept informed of lines of promotion and the necessary requirements. Follow-up studies are made of the careers of all persons in the professional service of the Bureau of Standards, and the Department of Agriculture to show salary increases, changes in duties, nature and extent of technical knowledge acquired in the performance of duties, courses of study attended, including those given within a Government department, the relationship of the training to advancement in the service and the salaries at which those leaving the Government service obtain on entering private industry.

Test Standardization.—Progress is being made in standardizing employment and promotion tests throughout Government educational institutions and outside industry, affording definite training and careers for youth and relieving employment of its haphazard character and turnover. Personnel administration has become a recognized science fraught with great possibilities of usefulness in guiding human endeavor in the most profitable channels.

Current Provisions.—In the Federal service, Congress has liberalized the Retirement Act and it is now believed that it may well serve as a model, just alike, to the interests of the Government and of the employees. Prohibition enforcement was transferred by Congress from the Treasury Department to the Department of Justice in order that it might be more effectually coördinated with prosecutions. A new law relating to the Personnel Classification Board eliminates the three alternates of the Director of the Budget, a Civil Service Commissioner and the Director of the Bureau of Efficiency. The Board, however, is to appoint a Director of Classification, and Assistant Director and an executive officer to have charge of the staff and work of the board. The board has published preliminary class specifications of positions in the field service embracing about 150,000 positions. The extension of the classification to the field service, however, will require action by Congress.

State and Local Services.—There are nine states and about 200 cities which have adopted the merit system for their local services, particularly fire, police, and charitable and penal institutions. In the past year these local commissions have made notable progress not merely in improved tests of fitness but in classification and compensation plans.

PERSONNEL MOVEMENT IN STATES

Progress.—While no unusual or spectacular advances have been made in connection with the personnel movement in the states during the past year, an encouraging tendency is noticeable on the part of officials and legislators to take stock of the personnel systems already in effect and urge improvement of such systems. Nine legislatures were in session in 1930. In one of these only—Mississippi, a state civil service bill was introduced, but no action was taken. In Wyoming and New Mexico, movements have been started to create public interest in the adoption of state civil service laws, and the assistance of the National Civil Service Reform League has been sought.

Wisconsin.—The revised Wisconsin Civil Service Law, which took effect in September, 1929, provides for a State Civil Service Commission of three members and a Director of Personnel to be the chief administrator of the new Personnel Bureau, which is now a part of the Executive Department. The new law effected various improvements and is reported to be working satisfactorily.

New Jersey.—A bill was passed revising the state personnel laws. The measure had the strong support of the Governor and the legislative leaders as well as of the Civil Service Commission, and created wide interest throughout the state.

Illinois.—The Illinois Civil Service Commission has been reorganized, and the new Commission has taken steps toward rehabilitating the state personnel system, revising its rules and reclassifying the service.

California.—Legislation has been enacted creating a personnel division in the Department of Finance and limiting the Civil Service Commission to judicial and legislative functions.

Classification plans are being developed for the services of the State of Ohio, St. Louis County in Minnesota (Duluth), the county services of Massachusetts, and the City of Minneapolis. The legislature has just appropriated $35,000 for this purpose in New York State. In Philadelphia $20,000 was appropriated for such a survey, to be conducted by outside experts under the supervision of the Civil Service Commission. The survey covers 20,000 positions in the city service, but excludes about 2,500 positions in the county departments.

STATE CIVIL SERVICE LAW

New Jersey.—The revision of the State Civil Service Law in New Jersey is logically arranged and contains the modern conceptions of personnel administration. One of the new features is that the State Civil Service Commission is required to certify to the need of existing positions and positions hereafter created in order to make legal the payment of salaries to officers and employees. Under this law a new set of rules, probably the most advanced in the country, has recently been adopted.

Wisconsin.—Under the law passed in 1929, a State Bureau of Personnel has been established in Wisconsin. The civil service commission is retained, but with only quasi-legislative and quasi-judicial powers. The personnel director, along with the director of the budget, the state purchasing agent, the state engineer, and one other, meet with the Governor to discuss business affairs each week. A number of activities heretofore neglected are now being carried on. The new law, the enlarged appropriations, and the new activities bid fair to bring Wisconsin into the front rank as far as personnel administration is concerned.

California.—A division of personnel and organization in the department of finance has been established. As in Wisconsin, the commission is retained, but its functions are quasi-legislative and quasi-judicial. Under the new law the service is being reclassified, the compensation scheme overhauled, the testing work improved, and additional activities will be taken on. An attempt is being made by the University of California, the division of personnel and organization of the Department of Finance and the Bureau of Public Personnel Administration to develop training courses for the public service at the University of California. The Division is assigning one of its examiners for half of his time to develop proper training courses at the University and to the educational and follow-up work in the state service. For the present, main attention is being directed to training for personnel work; two courses are being given, one for undergraduates to a class of 25 to 30, and a seminar for eleven graduate students, each of whom is undertaking a research project involving extensive field work. Many difficulties are being encountered, particularly in connection with having graduate students do work in the offices of the public personnel agencies, for which they are paid in academic credits instead of in money. It is too early yet to tell whether these difficulties can be overcome.

Training courses for persons in the public service are also being given at the University of Southern California. These are described in *Public Personnel Studies.* Between 250 and 300 students actually employed by the City and County of Los Angeles, the State of California, and the United States Government are taking evening courses in the civic center; and a number of these are working for a degree and a few for a graduate degree. Some of the classes are held in the City Hall and others meet at convenient downtown places. This is one of the most significant efforts that has been made in the United States to give training to large numbers of persons already in the public service. In addition, a short course lasting one week is held every spring with an attendance of 500 to 700.

RESEARCH AND STUDY

The Civil Service Assembly has undertaken extensive research work through technical committees, each consisting of one person as chairman and such other persons as the chairman may care to associate with himself. A comprehensive program has been worked out and at least twenty people engaged in public personnel work are setting aside an appreciable fraction of their time to carry on the studies.

Classification and Compensation.—Large classification and compensation studies are being carried on in the States of New York, Ohio and the City of Philadelphia. Smaller ones are being carried on in Gary, San Diego, the City and County of San Francisco, the Province of Saskatchewan, the County of Westchester, and Rochester, New York. An attempt is being made in Rochester to build up a modern personnel system under the city manager with the civil service commission giving such help as it can. The city manager wants a modern and comprehensive personnel system and is acting through a personnel director authorized in the city charter.

Massachusetts.—Legislation in Massachusetts following the study by a legislative committee is setting up the beginnings of a personnel system for thirteen counties (all in the state except Suffolk, in which Boston is located and which has a system of its own). A county personnel board consisting of three county commissioners from different parts of the state, selected by the county commissioners from among their own numbers, passes upon quasi-legislative and quasi-judicial matters. The administrative work is to be carried on through the state director of accounts. So far the central work is limited to the development and administration of classification and compensation plans.

RETIREMENT

The Dale-Lehlbach Retirement Bill was passed by Congress and signed by the President, May 29, 1930. This is a combination of the Retirement Bill passed by the Seventieth Congress, pocket-vetoed by President Coolidge, reintroduced in the Seventy-first Congress and passed by the Senate, and the new and more liberal Lehlbach Bill. It provides that employees who have served 30 years may retire at 68, 63 or 60 years (according to occupation), or two years below the regular retirement age; the service period after which an employee may be retired for disability is lowered from 15 to 5 years; and the maximum annuity is raised from $1,000 to $1,200. In addition to this maximum, provision is made for an additional annuity purchaseable by contributions from the employees. The percentage in contributions remains the same as at present (3½ per cent); but under the new law only $1 a month is applied to the cost of the basic annuity, which is $30 for each year of service; and the remainder of the 3½ per cent, with compounded interest at 4 per cent, is applied to the purchase of the additional annuity. Thus higher salaried employees will receive an annuity in excess of $1, because the greater the salary on which the 3½ per cent is levied the greater the amount of the annuity obtained.

Retirement Cost.—A larger number of employees than were included in the old retirement system is included in the new system. Senator Dale, who introduced the bill in the Senate, estimated an increased cost to the Government over the old law at $13,000,000 a year, making a total cost of approximately $33,000,000. The act took effect July 1, 1930.

PROHIBITION ENFORCEMENT

Change in Jurisdiction.—The bill to transfer the Prohibition Enforcement Unit from the Treasury Department to the Department of Justice was passed by Congress, signed by the President and took effect July 1, 1930. In the Senate it was sought to give the Attorney General a free hand in making appointments to all positions in the prohibition unit. After vigorous protests by the National Civil Service Reform League and the Civil Service Commission, the bill was passed practically in the form adopted in the House of Representatives, the Director, Assistant Director and attorneys to be exempt from the provisions of the Civil Service Law; and the prohibition enforcement agents to remain in the competitive classified service. Unsuccessful in its effort to have the attorneys employed by the prohibition unit included in the competitive class, the League wrote the Attorney General on June 2 urging that in making future appointments he take advantage of the facilities for selection offered by the Civil Service Commission.

Improvement.—In a radio address Aug. 28, Assistant Attorney General Youngquist, in charge of prohibition enforcement, stated: "There has been constant improvement in the quality of the agents since 1927, due to the operation of the civil service laws." A. W. W. Woodcock, new Prohibition Administrator, stated July 31: "The method of selection (of prohibition enforcement agents) has now, I am happy to say, been fixed by law; that is, through the Civil Service Commission. I propose to follow the civil service rules, not only in letter, but in spirit."

ALLEGED SALE OF POST OFFICES

Investigation in South.—The sub-committee of the Senate Committee on Post Offices and Post Roads which, under the chairmanship of Senator Brookhart of Iowa, investigated the alleged sale of Federal offices in southern states, was appointed in the Spring of 1928 subsequent to the introduction by the Georgia Senators of a resolution calling for an investigation of postmastership appointments in that state. The scope of the investigation, at first limited to Georgia, was extended to cover the entire country; but so far its principal fields have been Georgia, Mississippi, South Carolina and Texas. Originally the sub-committee consisted of Senator Brookhart, Chairman, and Senators Oddie of Nevada and Locher of Ohio, but the two latter were succeeded by Senators McKellar of Tennessee and Hastings of Delaware. Hearings were held during 1928 and 1929, and March 15, 1930, the sub-committee's report of its findings to date was presented to the Senate.

Findings in Georgia.—In Georgia the committee found that a "collecting" organization had been established by the Republican Central Committee with the object of collecting from 5 to 10 per cent of the salary of postmasters and other Federal officers appointed in that state. Investigation of witnesses revealed that lump sum donations were preferred, but if they were not forthcoming a regular monthly payment to the treasurer of the Central Committee was requested. The greater part of the money thus collected was used for salaries and traveling expenses for members of the political committee.

Mississippi.—Patronage in Mississippi was handled by Perry W. Howard, Negro national committeeman from that state, and special attorney general in the Department of Justice in Washington. An investigation of Howard's accounts in two Washington banks showed deposits in eighteen months considerably in excess of $31,000, exclusive of his $6,000 annual salary. Testimony showed that post offices in Mississippi were rather expensive—from $500 to $1,000 each. The transaction was made through the county chairman, who retained half of the money and passed half on to Howard. Howard was twice indicted, tried and acquitted in Mississippi, but was later allowed by Attorney General Sargent to resign.

South Carolina.—The sub-committee stated "from testimony taken by the committee and summing up of affidavits submitted with other testimony, it would indicate beyond a reasonable doubt that practically all the Federal offices were placed on sale by J. W. Tolbert (Chairman of the Republican State Committee) or through his representatives." An annual donation based on the salary of the office, as well as a down payment, seems to have been required.

Senator Blease read in the Senate on March 14 a letter from an applicant for a position as census enumerator, stating that he had been asked for a contribution by the census supervisor of his district; and one from Joseph W. Tolbert to the effect that each member of the State Advisory Committee is "required to raise stated amounts of money at regular intervals, this being collected from postmasters and rural carriers by the use of printed pledge cards, all against the rules and regulations of the department."

Texas.—The sub-committee found that in Texas "this organization based its support upon the solicitation of notes, in a large majority of cases, from prospective office seekers at the time the organization started under the direction of R. B. Creager. Later on the majority of the notes secured were from Federal employees or those anticipating appointment to Federal offices through R. B. Creager and his Texas organization." Out of a list of 350 persons who had given notes to Creager's organization, 242 were found, when checked up by the Post Office Department, to be postal employees. The report continues: "The records would indicate that the Republican State Committee of Texas for the years 1921 to 1928, inclusive, has taken around 3,116 notes and received cash payments thereon in the sum of $165,170. This, of course, does not include cash payments where no notes were taken." Evidence was adduced showing Creager's protection of discredited prohibition enforcement and customs officials. In one such case, after removal of a prohibition agent proved unfit to hold office, the man was reinstated through Creager's influence.

PERSONNEL TURNOVER IN PHILADELPHIA

In coöperation with the Civil Service Commission, the Philadelphia Bureau of Municipal Research, computed the turnover in the competitive class of the city service of Philadelphia for the year 1929. Since the Bureau had previously made similar computations for each year from 1920 to 1928, turnover figures for the competitive class are now available for a ten-year period—1920 to 1929 inclusive. The comparison of the turnover in 1929 with that of 1928 and also with the average turnover during the nine-year period—1920 to 1928 is an interesting one.

An unmistakable downward tendency is to be observed. For all departments the average annual separation rate during the nine-year period 1920-28 was 8.32 per cent; in 1928 it was 7.34 per cent; and in 1929 it was only 6.49 per cent. The figures for individual departments and bureaus give striking confirmation of the story told by the general averages. All except four of the organization units for which figures are shown for all the years 1920-29 had a lower turnover in 1928 than the average turnover for 1920-28, the four exceptions being the mayor's office, the bureau of gas, the department of city transit, and the department of law. In 1929, only two of these organizations—the bureau of police and the department of supplies and purchases—had a higher turnover than the average in the preceding nine years; all the others had lower turnover rates.

MUNICIPAL CIVIL SERVICE

A training school for municipal civil service commissioners and their secretaries was held in Albany April 24-25, under the direction of the New York State Civil Service Commission and the Mayors' Conference. This was an intensive short course of instruction lasting two days with morning, afternoon and evening classes. In this school there were taught the fundamentals of municipal civil service work, among the subjects taught dealing with preparation and conduct of oral and written examinations, the rating of papers, checking and certifying payrolls, certifying and appointing eligibles, and administration of the law relative to dismissals, removals, leave of absence, transfers, promotions and veterans.

PENAL ADMINISTRATION PERSONNEL

Public attention has recently been directed to the lack of competent and qualified personnel in penal administration. The sub-committee on pardons, parole, prohibition, penal laws and institutional correction of the National Crime Commission has pointed out the haphazard way in which prohibition officers, prison guards and other officials concerned with penal administration throughout the country are appointed, and has called particular attention to the flagrant disregard of proper personnel control in the corresponding state, county and city services. Such conditions exist throughout the country, not only with regard to the personnel of penal administration, but in practically every activity of government.

CURTIS MEMORIAL FUND

Through the generosity of Mrs. Francis C. Barlow there has been created a trust fund of $10,000 in memory of her brother-in-law, George William Curtis, one of the founders and President of the New York Civil Service Reform Association and later the first President of the national league, and one of the great leaders of the cause. This permanent trust fund is created under the name of "George William Curtis Memorial Fund," the income to be used for the purposes of the New York Association, with the understanding that as much of the income as may not be needed by that Association shall be paid over by it from time to time to the national league.

PERSONNEL OF THE JUDICIARY

By William M. Schuyler

Associate Editor, The American Year Book

SUPREME COURT OF THE UNITED STATES

Charles Evans Hughes (New York), Chief Justice of the United States, appointed 1930.

Oliver Wendell Holmes (Massachusetts), appointed 1902.

Willis Van Devanter (Wyoming), appointed 1910.

James Clark McReynolds (Tennessee), appointed 1914.

Louis Dembitz Brandeis (Massachusetts), appointed 1916.

George Sutherland (Utah), appointed 1922.

Pierce Butler (Minnesota), appointed 1922.

Harlan F. Stone (New York), appointed 1925.

Owen J. Roberts (Pennsylvania), appointed 1930.

Officers of the Supreme Court:

Clerk.—Charles Elmore Cropley.

Deputy Clerks.—Reginald C. Dilli, Hugh W. Barr.

Marshal.—Frank Key Green.

Reporter.—Ernest Knaebel.

CIRCUIT COURT OF APPEALS OF THE UNITED STATES

First Circuit.—Mr. Justice Holmes; George Hutchins Bingham (New Hampshire), George W. Anderson (Massachusetts), Scott Wilson (Maine).

Second Circuit.—Mr. Justice Stone; Martin T. Manton (New York), Learned Hand (New York), Thomas W. Swan (Connecticut), Augustus N. Hand (New York), Harrie Brigham Chase (Vermont), Julian W. Mack (New York).

Third Circuit.—Mr. Justice Brandeis; Joseph Buffington (Pennsylvania), J. Warren Davis (New Jersey), Victor B. Woolley (Delaware).

Fourth Circuit.—Mr. Chief Justice Hughes; Edmund Waddill, Jr. (Virginia), John J. Parker (North Carolina), Elliott Northcot (West Virginia).

Fifth Circuit.—Mr. Justice Roberts; Nathan P. Bryan (Florida), Rufus E. Foster (Louisiana).

Sixth Circuit.—Mr. Justice McReynolds; Arthur C. Denison (Michigan), Charles H. Moorman (Kentucky), Xenophon Hicks (Tennessee), Smith Hickenlooper (Ohio), Julian W. Mack (New York).

Seventh Circuit.—Mr. Justice Van Devanter; Samuel Alschuler (Illinois), Evan A. Evans (Wisconsin), William M. Sparks (Indiana).

Eighth Circuit.—Mr. Justice Butler; Kimbrough Stone (Missouri), William S. Kenyon (Iowa), Arba S. Van Valkenburgh (Missouri), Wilbur F. Booth (Minnesota), Archibald K. Gardner (South Dakota).

Ninth Circuit.—Mr. Justice Sutherland; William B. Gilbert (Oregon), Frank H. Rudkin (Washington), Curtis D. Wilbur (California).

Tenth Circuit.—Mr. Justice Van Devanter; Robert E. Lewis (Colorado), John H. Cotteral (Oklahoma), Orie L. Phillips (New Mexico), George T. McDermitt (Kansas).

UNITED STATES COURT OF CUSTOMS AND PATENT APPEALS

William J. Graham (Illinois), presiding judge, appointed 1924.

Oscar E. Bland (Indiana), appointed 1923.

Charles Sherrod Hatfield (Ohio), appointed 1923.

Finis James Garrett (Tennessee), appointed 1929.

Irvine L. Lenroot (Wisconsin), appointed 1929.

COURT OF APPEALS OF THE DISTRICT OF COLUMBIA

George E. Martin, Chief Justice.
Charles H. Robb.
Josiah A. Van Orsdel.

COURT OF CLAIMS OF THE UNITED STATES

Fenton Whitlock Booth (Illinois), Chief Justice, appointed 1908.

William Raymond Green (Iowa), appointed 1928.

Benjamin H. Littleton (Tennessee), appointed 1929.

Thomas S. Williams (Illinois), appointed 1929.

Richard Smith Whaley (South Carolina), appointed 1930.

SUPREME COURT OF THE DISTRICT OF COLUMBIA

Alfred A. Wheat, Chief Justice.
Wendell P. Stafford.
Frederick I. Siddons.
William Hitz.
Jennings Bailey.
Peyton Gordon.
Oscar R. Luhring.
Joseph W. Cox.
Jesse C. Adkins.

UNITED STATES CUSTOMS COURT

Israel F. Fischer, presiding judge.
Byron S. Waite.
Charles P. McClelland.
Jerry B. Sullivan.
George Stewart Brown.
George Morley Young.
William J. Tilson.
Genevieve R. Cline.
David H. Kincheloe.

UNITED STATES MARSHAL'S OFFICE

United States Marshal.—Edgar C. Snyder.

Chief Deputy Marshal.—Stephen B. Callahan.

UNITED STATES ATTORNEY'S OFFICE

United States Attorney, District of Columbia.—Leo A. Rover.

Assistants.—John W. Fihelly, David A. Hart, Rebekah S. Greathouse, Harold W. Orcutt, William H. Collins, M. Pearl McCall, Neil Burkinshaw, John B. Williams, Walter M. Shea, Renah F. Camalier, Charles B. Murray, William A. Gallagher, Irvin Goldstein, James R. Kirkland, James F. Hughes, John R. Fitzpatrick, Julian I. Richards, Frank W. Adams, Michael F. Keogh, Wilbert McInerney, Wilbur N. Baughman, John J. Sirica.

FEDERAL JUDICIAL PROSECUTIONS

By Howard Britton Morris

Department of History, College of the City of New York

GENERAL

Transference of Prohibition Jurisdiction.—The administrative work of the Department of Justice was complicated in 1930 by the transference of the prohibition enforcement to its jurisdiction from the Treasury Department. This change was effected July 1 when a new bureau was created within the Department of Justice for the purpose.

Congestion of Pending Cases.—Despite the addition of several new judges, the court calendars are still ongested, according to the Attorney General's report of Dec. 1, 1930. At the close of the fiscal year, the number of United States civil cases pending was 21,320, 212 cases more than in the preceding year. The number of criminal cases pending was 35,849, or 4,696 more.

TRUST ACTIONS

Department of Justice Attitude.—The attitude of the Department of Justice on the matter of trusts was expressed by the Department, May 15, as not embarking on a "trust-busting" campaign as the circumstances did not necessitate such an action, and only in cases of actual and deliberate violation of the Sherman Act would prosecution be instituted.

Radio Patent Case.—This attitude is seen in the suit brought against the Radio Corporation of America, General Electric Co., Westinghouse Electric and Manufacturing Co., American Telephone and Telegraph Co., and six other corporations (District Court at Wilmington, Del. May 13) wherein the Department of Justice pointed out that the suit was concerned chiefly with the legality of the patent arrangements between the defendants which, it was alleged, placed the control of radio and its development in the hands of the defendants.

Outdoor Advertising Monopoly.—In a prior case more definite action was taken when the Attorney General on April 22, filed suit in the U. S. District Court at Los Angeles, charging violation of the Sherman Anti-Trust Act in having established, or attempting to establish, a monopoly of outdoor advertising in Arizona, California, Oregon and Washington. (U. S. *v.* Foster and Kleiser Co., and Restop Realty Co.).

Packers Consent Decree.—The trend of opinion in the matter of softening the rigors of prosecutions under the Sherman Anti-Trust Law in the interests of general efficiency resulting in ultimate benefit to the public is shown by the progress in the Packer's Consent Decree (prohibiting wholesale meat packers from engaging in retail grocery business) wherein on Jan. 9, 1930, it was proposed that the Attorney General annul the Decree in the interests of efficiency. The Department of Justice on Jan. 18, countered this proposition by claiming that the petition to modify the Packer's Consent Decree should be dismissed as it did not present ultimate facts as a basis on which to present proper arguments for the court's decision and determination. Following this, on April 3, Armour and Co. and Swift and Co. petitioned the Supreme Court of the District of Columbia for relief from restrictions of the Decree, claiming the right to relief on the ground of public interest. The proceedings are still pending.

West Coast Theatres Injunction.—In the matter of the Paramount-Famous Players-Lasky merger, which was carried over from 1929, after an appeal filed April 16, 1930, in the U. S. Supreme Court to set aside the previous decree of the District Court, Southern District of New York, a consent decree was made perpetually enjoining the West Coast Theaters, Inc., *et al.*, from an alleged conspiracy in restraint of trade, and criminal proceedings were dismissed. (Aug. 23.)

Standard-Vacuum Oil Merger.—The history of the proposed merger of the Standard Oil Co. of New York with the Vacuum Oil Co. is as follows:—March 25, 1930, a petition was filed in the District Court, Eastern District of Missouri, to declare void a contract for the merger of the defendant companies as being in violation of a prior decree of dissolution. On April 29, the defendants denied the allegation. In presenting their side of the case, counsel for the Department of Justice filed a brief with the court wherein it was maintained the defendants were really contending for modification of the Standard Oil decree of 1912. The Counsel for the Department of Justice further asked the court to declare the proposed consolidation a violation of the 1912 decree. The answering briefs of the defendants, Oct. 2, claim that the merger is only a normal business transaction growing out of the particular needs and complementary nature of the two companies and will not be a re-creation of the old combination terminated in 1911.

Permissable Mergers.—In several cases mergers have been found permissible. In the case of the International Shoe Co. and the McElwain Co., it was found, January 7, 1930, that the acquisition of the stock of the McElwain Co. by the International Shoe Co. was not in violation of law. The merger of the Consolidated Cigar Corporation, of New York, with the G. H. P. Co., Inc., of New York, was allowed, Jan. 23, by the Federal Trade Commission as not being in violation of the Clayton Act. The proceedings brought against the Aluminum Co. of America before the Federal Trade Commission under the Clayton Act were dismissed April 5. May 28, the Attorney General made an announcement relative to the proposed merger of the Bethlehem Steel Co. and the Youngstown Sheet and Tube Co. that to date no evidence had been found that such merger would violate the provisions of the Clayton Anti-Trust Act.

Labor Union Boycott.—The anti-trust laws were also applied to labor unions as in the case of U. S. *v.* Painters District Council No. 14 of Chicago (District Court of Northern District of Illinois, Oct. 6) where it was held that in the case of labor unions and their officers who attempted by the threat of boycott, or similar means, to force favorable action by manufacturers in other states, that they could be restrained by Federal judicial action under the Federal Anti-Trust Laws, as interfering with interstate commerce to an unreasonable degree. To this was added the principle that the law can not be violated to effect what may be a worthy motive.

Corporate Dissolution and Court Jurisdiction.—In the case of U. S. *v.* Bates Valve Corporation, *et al.*, it was held that a decree of dissolution does not deprive a court of its jurisdiction over the corporation.

INTERSTATE COMMERCE

Land and Water Carriers.—Nov. 25, 1929, the Supreme Court in the case of U. S. *v.* Clyde Steamship Co., held that the Interstate Commerce Commission can compel carriers to submit all records to it where the business is carried on by land and by water; refusal of submission incurs penalty of $500 daily, which was held not to be excessive. However, in the case of the U. S. *v.* Munson Steamship Line (Circuit Court of Appeals, 4) on Jan. 29, 1930, it was held that the right of the Commission to control water carriers did not extend where the said carriers accepted freight from rail carriers, paid the rail charges and issued their own bills of lading for the water shipment, and collected the total charges from the ultimate consignee. This apparently leaves for interpretation the question of what constituted business by land and water, and business by water only to be settled by the bills of lading issued.

"Commodity Clause" Case.—June 19, 1930, suit was brought in the U. S. District Court, Northern District of Illinois, at the direction of the Attorney General, and the request of the Interstate Commerce Commission, against the Elgin, Joliet and Eastern Railway to restrain it from transporting in interstate commerce the products of the U. S. Steel Corporation, on the grounds of violating the "commodity clause" of the Interstate Commerce Act of 1887, as the Elgin, Joliet, and Eastern Railway is alleged to be owned by the U. S. Steel Corporation. (Under the Act of 1887 it is unlawful for any railway to transport in interstate commerce materials and commodities manufactured by it or under its authority, or in which the railroad, any controlling factor, or subsidiary, has an interest.)

Definitions of Railroad Terms.—In the case of the U. S. *v.* the Chicago, St. Paul, Minneapolis, and Omaha Railway Corporation (Circuit Court of Appeals 8, Aug. 18, 1930) there was a series of decisions over the definition of the terms "car," "locomotive," etc., in which the chief point was that if the Interstate Commerce Commission acquiesced in a customary definition by the railroads, it carried over to the meaning of a provision of the Safety Appliance Acts.

Rate-making Jurisdiction. — A temporary restraining order granted by a district court in restraint of a rate-making order by a board of railway commissioners does not deprive the Interstate Commerce Commission of jurisdiction in regard to complaints by interstate carriers. (Interstate Commerce Commission *v.* Northern Pacific Railway, District Court of Appeals.)

BANKING

If an officer of a Federal Reserve Bank makes a false entry when making a report of the conditions of the bank, he may be prosecuted therefor, even though acquitted previously under an indictment in which he was charged with having made false entries in the books of the bank based upon a draft. (U. S. *v.* Adams., U. S. Supreme Court).

JURISDICTION

The courts of the District of Columbia may be invested by Congress with legislative and advisory powers and an appeal from a decision of the Radio Commission to that court will not be heard by the U. S. Supreme Court as the District Court was acting as a revising agency only. (U. S. *v.* General Electric Co., U. S. Supreme Court, May 20, 1930.)

EVIDENCE

Limitation of Seizure.—In making the arrest of a truckman in connection with a false manifest, the arresting officer had no right to seize any papers and documents other than those relating to the particular shipment upon which the charge was laid, and upon a proper showing that the officer had exceeded his authority the court will order the return of any papers so seized. (U. S. *v.* Bollen, Circuit Court of Appeals 2, Aug. 7, 1930.)

Search Warrant Validity.—In the case of U. S. *v.* Pete Bosoni, *et al.*, it was held that evidence obtained by the use of an invalid search warrant should be suppressed on the grounds that the Government by securing a warant admitted the legal necessity theerof and upon the finding that the warant was invalid could not then proceed upon the ground that no warrant was necessary. Where a search and seizure was unlawfully made under the Internal Revenue Act without a warrant, the property seized is not subject to forfeiture on the ground that as the search was unlawful all subsequent proceedings based on the unlawful act must also fail, although suspicious circumstances were disclosed by the original search. (U. S. *v.* Excelsior Brewery, Inc., District Court, Eastern District of New York, Oct. 20, 1930).

PROHIBITION

Rules of Evidence.—For the fiscal year just terminated the number of civil prohibition cases commenced was 11,882, and the number of criminal cases 56,992, an increase of 645 and 206 respectively. (P. 5 of the Attorney General's report for the fiscal year ended June 30, 1930). A number of the prohibition cases of the past year are of more importance as establishing rules of evidence than as interpretations of the Prohibition Act. Among these are: U. S. *v.* Rabenstein, *et al.*, in which it was held by the District Court, District of Eastern New Jersey, that entry by Prohibition officers without a warrant was unlawful. The District Court, Western District of Pennsylvania, held in the case of U. S. *v.* Contraband Liquors (Dr. Thomas) that the Federal Courts have no power under Section 25 of the National Prohibition Act to condemn and forfeit liquor seized without warrant by state officers. To the contrary, is the case in the U. S. District Court, Southern District of Texas, where in U. S. *v.* Rosenett (July 21, 1930), it was held that officers could testify as to what they saw and found on a state search made without a warrant. Ten days later the same court held in U. S. *v.* Smith that officers could make a search of premises being used as a public nuisance in the sale of liquor without a warrant if they purchased liquor, even under the fraudulent pretext of entry as customers. To the same effect as the Rosenett case is the case of U. S. *v.* Murphy (District Court, District of New Jersey, Sept. 4, 1930.) A search warrant will be held void where a misdescription of the premises is made fraudulently to enable the officers to avoid the requirements of purchase and sale of liquor. (U. S. *v.* Murdough, District Court, Western District of Pennsylvania, October 14, 1930. The subterfuge of a constable's search of a truck, without warrant, on the grounds of traffic violations, but with the seizure of liquor in mind, was frowned upon in the case of the U. S. *v.* Valisio (District Court of New York, Eastern District, May 20, 1930) where such procedure arising from inspection for insufficient lights was held illegal and the evidence thus obtained was suppressed.

Individual Purchaser.—The most important of the true prohibition cases was that of U. S. *v.* Farrar (U. S. Supreme Court, May 26, 1930) in which it was held that Congress in enacting the National Prohibition Act did not intend to hold the individual purchaser liable, and that Section 6 of the Act, "that no one shall purchase any liquor without first obtaining a permit from the Commissioner to do so," etc., was meant to aply only to that class of purchasers who were authorized to deal with liquors for non-beverage purposes.

Forfeiture.—Forfeiture being one of the penalties of the National Prohibition Act, it is of interest to note the trend along that line. The arrest and conviction of a person in charge of a boat for a violation of the National Prohibition Act does not support a forfeiture of the boat as the ruling in the Richbourg case (281 U. S. 528) is applied to vessels as well as vehicles (U. S. *v.* Motor Boat K19853. District Court, New Jersey). However, the use of a vessel contrary to the terms of its license, and in an illegal act, subjects such vessel to forfeiture under the Tariff Act of 1922, although the contraband cargo was liquor and proceedings were not brought under the Prohibition Act. (U. S. *v* Motor Trawler "Pilot" etc., Circuit Court of Appeals 3, Sept. 19, 1930.) Actual foreign origin of goods is necessary to support a forfeiture for illegal entry and the vessel must be actually actively engaged in the overt act at the time of apprehension. The mere presence of goods with an ostensible foreign label found on a vessel tied at a pier is insufficient to establish a forfeiture. (U. S. *v.* American Gas Screw, *Evelyn Ruth*, District Court, Massachusetts, July 3, 1930.) An automobile can not be forfeited under the revenue laws, if the United States District Attorney admits in open court that the automobile was being used in the transportation of liquor. (U. S. *v.* LaSalle Sedan. Circuit Court of Appeals, 9, July 14, 1930. Cf. Richbourg *v.* U. S., 281 U. S. 528.) The provisions relating to forfeiture of vehicles used with intent to defraud the United States of the tax on liquors makes no distinction between domestic spirits and those of foreign origin. (U. S. *v.* Packard Truck License No. 673462, etc., Circuit Court of Appeals, 9.) This is a different issue of law, it should be noted, from that of the case of the *Evelyn Ruth*, cited above. The mere possession, buying and selling of casks, etc., in connection with another line of business was held to be at the time of sale no violation of the National Prohibition Act, although such articles could be so used at a subsequent time. (U. S. *v.* Vetra, *et al.*, District Court, Wyoming.)

Jones-Stalker Act.—In declaring its intention by the passage of the Jones-Stalker Act, Congress, by giving the right of discrimination between slight violations and attempts to commercialize violations of the law, did not give to the court any exclusively legislative power, nor is the position of the court different from that of any act in which the court has the choice between a minimum and maximum penalty, and therefore the statute is not unconstitutional. (Ross *v.* U. S. Circuit Court of Appeals, 4.)

Nuisance.—In many cases prosecution of liquor dealers has been on grounds of nuisances, and the ruling of the District Court, Western District of Pennsylvania in the case of U. S. *v.* Arnold is of interest. Here it was held that one sale of liquor is sufficient to constitute a nuisance under the facts of the case. It should be observed that this ruling, while in contrast to that just cited in regard to severity of offense, is on the grounds of nuisance, not felony.

Interpretation of Evidence.—The sort of evidence that may be brought into Court is defined in U. S. *v.* 8, 765 barrels. (District Court, Southern District of New York.) It was held that only such personal property as could be brought before court on a search warrant would be admitted.

COGNATE SOCIETIES

American Academy of Political and Social Science, 3622 Locust Street, Philadelphia, Pa.

American Bar Assn., 209 S. LaSalle Street, Chicago, Ill.

American Constitutional League, 27 William Street, New York City.

American Defense Society, Inc., 154 Nassau Street, New York City.

American Political Science Assn., Angell Hall, University of Michigan, Ann Arbor, Mich.

Better Government League, Washington, D. C.

Commercial Law League of America, 137 S. LaSalle St., Chicago, Ill.

Honest Ballot Assn., Inc., 120 Broadway, New York City.

League for Political Education, 113 West 43rd St., New York City.

League for Public Discussion, 500 Fifth Ave., New York City.

National Assn. for Constitutional Government, 716 Colorado Building, Washington.

National Assn. of Legal Aid Organizations, 3660 University Ave., Los Angeles, Calif.

National Civil Service Reform League, 519 Fifth Ave., New York City.

National Institute of Public Administration, 261 Broadway, New York City.

Voters' Educational League, 524 First Avenue, New York City.

DIVISION IV

STATE GOVERNMENT

NATIONAL AND INTERSTATE RELATIONS OF STATES

BY JOHN M. MATHEWS

PROFESSOR, UNIVERSITY OF ILLINOIS

STATE APPORTIONMENT IN CONGRESS

As pointed out in THE AMERICAN YEAR BOOK for 1929 (p. 91), Congress passed an act in that year providing for a reapportionment of representation in the lower House of Congress on the basis of the census of 1930. Shortly before the convening of Congress in December, announcement was made by the executive of the representation of each state on this basis. Some states gained, others lost, and still others remained stationary. The greatest gains were made in California, Florida, and Michigan. This plan is still subject to the acceptance of Congress. Opposition to it has developed in that body, especially from states whose representation would be decreased. The latter are mostly states without very large cities. Their representatives have suggested that aliens ought not to be counted in determining the basis of representation in the lower House of Congress. There is no precedent, however, for failing to count aliens, and, however desirable it might be, it hardly seems compatible with the Constitution.

PROHIBITION

Some of the opposition in Congress to allowing aliens to be counted in determining the basis of representation in the lower House of that body is probably due to the fact that the states in which the largest number of aliens are found are also those in which "wet" sentiment most decidedly predominates. A reapportionment, therefore, which takes aliens into consideration would doubtless increase the anti-prohibition vote in Congress, and possibly endanger the Volstead Act.

There has been some discussion as to whether it is the duty of the states to coöperate with Congress in enforcing Prohibition. It has been argued that it is a duty, but one not capable of being enforced. Such an interpretation, however, seems to strain the language of the Constitution, which merely grants the states a power but does not require them to exercise it. At any rate, sentiment seems to be growing in favor of repeal of state prohibition enforcement acts. In most cases where the question of retaining such acts was submitted to the voters at the November election, the preponderant vote was in the negative. In Rhode Island and Illinois the voters also indicated by substantial majorities that they favored the repeal of the Eighteenth Amendment.

PUBLIC WATERS

Hoover Dam.—During the year construction on the Boulder Dam, otherwise known as the Hoover Dam, at Black Canyon on the Colorado River was begun, in accordance with the Act of Congress. A power plant will be erected at the Dam, and it is expected that the sale of power will, within a period of fifty years, produce sufficient revenue to repay the Government its investment in the project, including interests, depreciation and operating expenses. In anticipation of the sale of power, Secretary of the Interior Wilbur has fixed its price at 1.63 mills per kilowatt-hour. The Secretary also allocated 36 per cent of the power to be developed at the Dam to Arizona and Nevada and 64 per cent to California. The latter percentage was reallocated to the city of Los Angeles, the Metropolitan Water District, and the Southern California Edison Company.

Illinois River Diversion.—As pointed out in THE AMERICAN YEAR BOOK for 1929 (p. 91), the Supreme Court of the United States rendered a decision ordering cessation of the diversion of water from Lake Michigan into the Illinois River. On account of the extreme drought in the summer of 1930, however, and in order to afford relief to the residents of the Illinois River valley where low water conditions had endangered public health, Secretary of War Hurley, acting upon request from Governor Emmerson of Illinois, ordered the doubling of the flow of water through the Chicago Sanitary Canal. The legal staff of the War Department had previously advised him that the flow could be increased as an emergency relief measure without placing the Secretary of War in contempt of the Supreme Court.

CONFERENCE OF GOVERNORS

Federal Subsidies for Highways.—The annual conference of governors met at Salt Lake City in July. It devoted considerable attention to relations between the states and the National Government. Gov. Christianson of Minnesota took occasion to denounce the practice of the states in accepting subsidies from the National Government for highway construction and other purposes on a fifty-fifty or dollar for dollar basis. He claimed that this plan had the effect of placing an undue burden upon the taxpayer and of giving the National Government a club over the states.

Unappropriated Lands.—In reference to the proposal of President Hoover to turn unappropriated public land over to the states, the western governors generally gave it their approval. They protested, however, against his plan to give the states merely the surface rights to the land, reserving mineral, oil and other subsurface rights to the National Government in the interest of conservation of natural resources.

Drought Relief.—Special conferences of state governors are held from time to time to consider special situations which arise. For example, in August President Hoover summoned a conference in Washington of the governors of the eleven most seriously affected states in order to determine upon the most effective steps to take in affording relief from the unprecedented drought.

CONFERENCE ON UNIFORM LAWS

In August the fortieth annual conference of commissioners on uniform state laws was held in Chicago. The vexed question of divorce figured prominently in the discussions. A uniform divorce law is not yet in sight, but the conference confined its efforts to drafting a law making uniform requirements to give courts jurisdiction in divorce cases. Other matters considered or reported on at the conference include a uniform state licensing act for air pilots, a child labor act, a narcotic act, and a fire arms act.

STATE CONSTITUTIONS, REFERENDA AND INITIATIVES

BY FREDERIC H. GUILD

PROFESSOR, UNIVERSITY OF KANSAS

MEASURES SUBMITTED TO VOTERS

Enumeration.—In 38 states 207 propositions to the voters in 1930:—constitutional amendments 161, 79 adopted; laws 46, 27 adopted. Of 19 initiated amendments only one passed. Of nine initiated laws four passed. Of 17 laws referred on petition, 10 were defeated. Legislatures referred 17 laws, and 13 of these were adopted. The largest number of questions submitted were: California, 20 amendments and 6 laws; South Carolina, 21 amendments, mostly local; Georgia, 13 amendments; Oregon, 11 amendments and 3 laws; and Arkansas, 9 amendments and 2 laws.

Constitutional Amendments.—The six amendments proposed by the New Hampshire constitutional convention of June, 1930, were all defeated. The most significant of the measures adopted were; — biennial session, South Carolina; split session, Texas; income tax, Arkansas, Oregon and Utah; permanent registration, California; creation of state tax commission with powers following the "Indiana plan," Utah; classification of property for taxation, Washington, South Carolina and Utah; bonds for a new state capitol, Lousiana; the bid for industries by five and fifteen year exemptions from taxation in Louisiana and Florida; and the decidedly "wet" vote on referenda in Illinois, Massachusetts and Rhode Island.

Constitutional Expansion. — The tendency towards simplification of constitutional provisions continued to make slow progress, but the older and contrary movement towards lengthening constitutions and incorporating legislative detail was still in evidence. Louisiana led in this by adding 28 new sections covering 21 printed pages, its six page amendment on highway funds including a map of the proposed paved highway routes. The Arizona highway amendment covered six pages and California added six new sections. The longest proposition on the ballots was the initiated workmen's compensation law which failed in Missouri, covering nearly 12 newspaper columns.

Bond Issues. — Bonds totalling $272,000,000 were approved as follows:—New Jersey, $83,000,000 for highways; $10,000,000 for construction of state institutions, and $7,000,000 to purchase water rights to preserve the potable waters of the state; Louisiana, for highways, $68,000,000, for a new state capitol, $5,000,000, and to liquidate the debt and construct public markets in New Orleans, $4,500,000; New York, $50,000,000 for emergency construction for the Departments of Mental Hygiene and Correction; California, $20,000,000 to provide farms and homes for veterans, and legalization of $10,000,000 for San Francisco Harbor; North Carolina, $2,000,000 for war veterans loans. Baltimore, by referendum on city ordinance, approved $10,000,000 for a harbor improvement fund. Only three states rejected proposals; Arizona, $10,000,000 for highways; Illinois, $14,000,000 for a statewide system of forest preserves and recreation grounds; and Rhode Island, $2,300,000 for a new Providence Court House.

CONSTITUTIONAL REVISION

Constitutional Convention.—Maryland authorized, but California, Colorado, Indiana and Iowa defeated calls for constitutional conventions. Missouri failed to liberalize its amending process.

Corporations. — California revised its provisions concerning corporations and Illinois its banking law. Liability of stockholders was altered by Minnesota for corporations, and by Nebraska for banks. The depository guarantee fund law was repealed in North Dakota. Nebraska rejected a proposal that the state pay the deficit in the fund.

Courts.—Illinois approved women as jurors and jury commissioners. South Dakota authorized judges to suspend sentence. North Carolina refused to increase the number of supreme court justices from five to seven. West Virginia rejected a new section on probate jurisdiction. North Dakota failed to increase the terms of office for judges, and salary increases were defeated in Missouri, South Dakota and Oregon.

Elections. — State-wide permanent registration was approved in California, which also reduced residence requirement for voting. New Hampshire and Rhode Island rejected absentee voting. South Carolina liberalized its tax payment requirement, reducing to thirty days before election the time when the tax must be paid. For bond elections Arizona provided that voters must also be real property owners, and Florida specified freeholders.

Legislature.—South Carolina adopted biennial sessions and authorized special sessions of the senate. Texas adopted the split session and increased pay of legislators, but other attempts for the latter were defeated in Kansas, Missouri, Oregon, South Dakota, and Washington. Washington, Oregan and Utah removed the necessity for special elections to fill vacancies. Massachusetts revised its re-apportionment provisions, but in New Hampshire a measure to reduce the size of the house failed as did the Michigan proposal to permit the secretary of state to reapportion if the legislature failed to act. Arizona rejected a proposal to apportion the House on the basis of one representative for each three thousand votes cast for governor in the preceding election.

Local Government. — City-county consolidation was approved in South Carolina but the new provision for St. Louis failed in Missouri. Nebraska approved an initiated measure authorizing cities or districts owning power plants or transmission lines to serve farmers and others beyond their boundaries; to pay for plants out of future earnings instead of by taxation; and forbade the sale of plants except by a 60 per cent vote. California revised the method of amending municipal charters. Georgia rejected pensions for Fulton county officers and employees, and zoning and planning laws for counties. South Dakota authorized classification of property for taxation in school districts to make agricultural lands a separate class. Texas authorized local taxation of state lands belonging to the university, and California the taxation of government-owned toll bridges as long as tolls were collected. South Dakota, recently in possession of a large acreage by foreclosure under the rural credits act, authorized local taxation of such lands.

STATE ADMINISTRATION

General. — Oregon rejected the amendment for election of governor, secretary of state and treasurer only, and reorganization of the administration under nine departments. California rejected inclusion under departments of all constitutional officers appointed by the governor. Idaho abolished the separate board of directors for the Blackfoot Asylum. The item veto was approved in Wisconsin but defeated in New Hampshire. West Virginia failed to alter its executive budget to shift preparation directly to the governor. permitting the legislature to increase as well as diminish amounts, and giving the governor the item veto. Proposals to institute lieutenant governors were rejected in Oregon and West Virginia.

Salaries and Office Qualifications. —Arizona made an exception in its prohibition of increase in salary during term of office to permit equal pay for members of the same court or commission. Oklahoma rejected the so-called woman's amendment to remove the word "male" from the qualifications for holding constitutional executive offices. Michigan refused to authorize the state to engage in internal improvements by improving rivers for drainage purposes. Retirement salaries for state employees were approved in California, but the removal of salary specifications for state executive officers failed, as did similar proposals in Oregon and South Dakota. In Arizona all workers on government work must now be full citizens of the United States. North Dakota refused to change terms of state and local officers from two to four years.

Education.—New Mexico refused to create a new board of education, and Colorado rejected an elected instead of an ex-officio state board of education, and appointment of the commissioner of education. Arkansas rejected an initiated measure prohibiting the legislature from establishing any institution of learning and prescribing popular initiative as the sole method, but approved an act for the reverent daily reading of the English Bible without comments in all public-tax supported schools up to and including high schools. Louisiana ratified increased support of schools and Montana voted a three mill tax for higher education.

TAXATION

Tax relief by removal of general property limitations, or classification of property, met with success in Oregon, Washington, Utah, and South Carolina, but failed in Illinois. The income tax was approved on referendum in Arkansas but was defeated in Georgia and Kansas. License or gasoline taxes, in lieu of personal property taxes on automobiles, failed in Arizona and California, as did a slightly different registry tax in South Dakota. The cigarette tax referendum was defeated in Michigan as was the tax on all tobacco in New Mexico. The Oregon law prohibiting the sale of cigarettes also failed. Florida authorized an estate tax but only to the extent of absorbing the credit deductible from the Federal tax. Similar provisions in New Hampshire and Arkansas were defeated. Utah created a very modern tax commission, authorized the legislature to exempt intangibles, and exempted power plants used for irrigation. Georgia rejected a somewhat similar exemption of power projects embracing flood control. Exemption of hospitals failed in California, and New Hampshire rejected authorization of exemptions from the income tax.

WAR VETERANS

War veterans received consideration in five states. Louisiana liberalized the allowance to Confederate veterans. North Carolina and California approved bonds for loans. Utah authorized $3,000 tax exemption to disabled veterans, their widows and orphans, but Oregon refused to extend the soldier bonus to other veterans.

PROHIBITION

The prohibition vote was as follows: Illinois, nearly two to one for three "public policy" questions submitted—repeal of the 18th amendment; modification of the Volstead Act; and repeal of the state prohibition law. Rhode Island, three and a half to one aganst retention of the 18th amendment. Massachusetts, which had voted in 1928 seven to four against the 18th amendment and the Volstead Act, two to one for repeal of the state enforcement law.

MISCELLANEOUS

Two Sunday closing laws, initiated, failed;—in California, to require Sunday closing; in North Dakota, to permit shows after one o'clock. Daylight saving, initiated law in California, was defeated as was a similar ordinance referred in Baltimore. Public utility districts were authorized in Oregon to supply water for domestic and municipal purposes and to develop water power and electric energy.

STATE LEGISLATURES AND LEGISLATION

By John M. Mathews

Professor, University of Illinois

LEGISLATIVE SESSIONS

The year 1930 was an off-year in matters of state legislation, since the legislative bodies in most of the states were not in session. In Kentucky, Virginia, and Mississippi, however, the legislature meets biennially in the even-numbered years, while in five states—Massachusetts, New York, New Jersey, Rhode Island, and South Carolina—the legislatures meet annually. In addition, special sessions were held in a number of other states, including Illinois, Kansas, New Hampshire, and Utah. New Jersey held a special session in addition to its regular session.

The tendency is away from annual to biennial sessions. Governor Richards of South Carolina, in his message to the legislative session of 1930, recommended the abolition of annual sessions and the adoption of biennial sessions. The process of change, however, is slow on account of the necessity of constitutional amendment. In New Hampshire, an attempt was made to reduce the size of the lower house from about 425 to about 350.

AMERICAN LEGISLATORS' ASSOCIATION

The American Legislators' Association, established three years ago, is gradually increasing in strength and activity. It held its annual meeting at Cleveland in November. Its most noteworthy achievement during the year was the establishment of a magazine known as *State Government,* which is its official organ. The principal objective of the Association is to serve as a clearing-house of information regarding matters of concern to legislators, and, to this end, to establish an interstate legislative reference bureau.

LEGISLATIVE REAPPORTIONMENT

Illinois.—The struggle between the cities and rural districts over the question of representation in the state legislature continues to vex a number of states. The situation in this respect is especially acute in Illinois, where there has been no reapportionment since 1901. The contest between Chicago and down-state over this matter affects various other public affairs of the state not directly concerned. For example, a proposed amendment to the state constitution designed to give the legislature larger powers in classifying property for purposes of taxation was fought in the state legislature by the Chicago members until a concession was made whereby it was provided that 85 per cent of the proceeds of the tax should be paid back to the county in which collected. Even after this concession had been made and the amendment submitted to the people at the November election, it was defeated largely because of the opposition of Chicago based to a considerable extent on the ground that no reapportionment had been made.

California.—The question of reapportionment is also acute in California where the southern part of the state is increasing in population at a much more rapid rate than the central and northern parts, but the latter parts command a majority in the legislature, and are not inclined to give up their advantage without a struggle.

Michigan. — A reapportionment amendment to the state constitution placing apportionment of cities in the legislature on a straight population basis was submitted at the November election, but was defeated.

Kentucky.—Governor Sampson of Kentucky, in his message to the legislative session of 1930 recommended legislative reapportionment as a needed general improvement of state government.

COMPENSATION OF OREGON LEGISLATORS

In Oregon the compensation of members of the legislature is fixed by the constitution at three dollars per diem with a maximum of $120 per session. In spite of the manifest inadequacy of this amount, it has not been found feasible to secure a change. An attempt to evade the constitutional provision was made at the legislative session of 1929 through the passage of a joint resolution authorizing the payment to legislators of five dollars per diem for incidental expenses. In 1930, however, the state supreme court declared this joint resolution unconstitutional, as an indirect evasion of the fundamental law.

POWER TO PUNISH FOR CONTEMPT

The power of legislative bodies to punish private individuals for contempt was considered in a case which arose in the supreme court of California. In the course of an investigation into an alleged cement trust, the legislature of that state had summoned certain witnesses, who refused to appear, and were consequently declared guilty of contempt. The court upheld the right of the legislature or of its committees to declare recalcitrant witnesses guilty of contempt, but limited the power by assenting that such witnesses should be given the opportunity to appear and show cause why the contempt order should be vacated.

STATE EXECUTIVES AND DEPARTMENTS

By John M. Mathews
Professor, University of Illinois

THE GOVERNORSHIP

To such regular and special legislative sessions as met during 1930 the governor, according to custom and the constitution, transmitted messages outlining the condition of state affairs and recommending such legislation as in his opinion may be needed. Such messages are addressed as much to the general public as to the legislature, and advance copies are furnished to the newspapers. Some of the recommendations of the governor are doubtless intended rather to sound out public opinion than actually to secure immediate legislation. In these instances, therefore, the failure of the legislature to carry out the governor's recommendations does not necessarily indicate a lack of harmony between the executive and legislative departments.

LIEUTENANT-GOVERNORSHIP IN OREGON

Oregon is one of the few states which has no lieutenant-governor, and at the November election the question was submitted to the voters as to whether the state should have such an officer. The need for such an officer would seem to have been indicated by the fact that, within recent years, three Oregon governors have died or resigned. Nevertheless the voters, doubtless feeling that the state had enough governmental machinery, rejected the proposal.

THE EXECUTIVE BUDGET IN NEW YORK

The contest in New York state over the control of the finances has been particularly strenuous, largely because the governor and the majority of the legislature have usually been affiliated with different political parties. In 1927 a constitutional amendment was adopted embodying an executive budget, authorizing the governor to submit to the legislature a budget containing a complete plan of proposed expenditures and estimated revenues. The budget, as submitted by the governor to the session of 1929, contained a number of lump-sum items which were to be subsequently segregated. Under the terms of the governor's budget such segregation could be carried out only with the approval of the governor. This provision, however, conflicted with an act of the legislature which provided that such segregation should be carried out with the approval not only of the governor, but also of the chairman of the Finance Committee of the Senate and of the chairman of the Ways and Means Committee of the Assembly.

The conflict thus engendered was later submitted to the courts in the form of an action brought by the attorney-general to enjoin the comptroller from paying out funds without the approval of the chairmen of the legislative committees. The case having been carried to the Court of Appeals, the highest court in the state, that tribunal, in the case of People *vs.* Tremaine, concluded late in 1929, held unconstitutional the act of the legislature requiring the approval of the legislative chairmen to the segregation of lump-sum items. The basis of the decision was that the act of the legislature violated the principle of separation of powers, in that it conferred administrative power on members of the legislature. The decision was, in this respect, a victory for the governor. Certain dicta of the court, however, indicate that the power of segregating lump-sum appropriations belongs not to the governor but to the heads of the executive departments concerned. This part of the opinion, therefore, militates against the centralization of financial control.

In this connection should be mentioned the recommendation of Governor Roosevelt of New York, made in his annual message to the legislature of 1930, that the governor's term should be lengthened to four years. If this suggestion were carried out, the power of the governor would be increased over financial as well as other matters.

STATE ADMINISTRATION AND JUDICIARY

By John M. Mathews
Professor, University of Illinois

ADMINISTRATIVE REORGANIZATION

Proposed Cabinet Plan in Oregon.—An ambitious scheme for the establishment of a state cabinet plan was proposed by the legislature of Oregon and submitted to the voters at the November election. The plan provides for the abolition of all existing state offices, boards, and commissions except the offices of governor, secretary of state and state treasurer. Nine new state departments are created, as follows: agriculture, labor and industry, finance, commerce, education, public works and domain, health and public welfare, state police, and legal affairs. Each of these departments, except that of education, is in charge of a director appointed by the governor with the consent of the Senate. The department of education is under a board. All state activities are grouped under these nine departments. This promising plan was, however, decisively rejected by the voters at the November election.

Kansas.—A bill was introduced in the special legislative session of 1930 providing for a state manager and for state administrative reorganization, but failed of passage.

New Jersey.—Reports of two surveys of the state governmental machinery were made during the year. The first, which was published in March, was made by the National Institute of Public Administration. It recommended a thoroughgoing reorganization of the state administration, the abolition of nearly 100 separate agencies and the consolidation of their work into thirteen major departments. One of these departments, that of public works, would absorb the state house commission, composed of the governor, controller, and state treasurer. The other report was made in November by the New Jersey State Audit and Finance Commission, also known as the Abell Survey Commission. This commission recommended the taking away from the state house commission its present powers except those connected with the handling of state bonds. It also recommended placing a curb upon the excessive powers of the state highway commission. In general, it advocated the abolition, creation, or consolidation of numerous branches of the state government.

Centralization Tendencies.—Although little actual progress in state administrative reorganization has been made during the year, the prevailing sentiment still seems to be in the direction of centralization and increase of the governor's power. This tendency may be noticed even in Wisconsin, which has hitherto been a stronghold of the independent board plan of organization. Governor Roosevelt of New York has publicly approved in strong terms the results of the centralized plan of reorganized administration in that state. Many state governors in their messages to the legislature recommend the adoption of a similar plan.

STATE CIVIL SERVICE

New Jersey.—Although New Jersey has been under the merit system since 1908, its law on the subject has been in need of renovation and this was finally accomplished at the legislative session of 1930. The bill passed was drawn up and recommended by the state civil service commission. It authorizes the commission to control the creation of new positions and requires it to establish uniform regulations regarding hours of work and standards of performance of the personnel in the classified service. As originally drawn up, the bill applied not only to the state service but also to that of counties and cities which should adopt it by referendum. The operation of the latter provision, however, has been postponed for a year.

Personnel.—The need for a more efficient personnel in the state civil service is emphasized by the increasing functions of the state. As an example of this, it may be mentioned that two states, Connecticut and Rhode Island, have recently placed taxicabs under state regulation.

THE STATE JUDICIARY

Reform Recommendations. — On account of its innate conservatism, the state judiciary has been the most backward department of the state government and the one most in need of reform. This condition, however, is coming to be more generally realized and various movements for reform have been inaugurated. Governor Roosevelt of New York, in his annual message to the legislature of 1930, recommended the creation of a commission composed of lawyers and laymen to study the problem of judicial reform. The judicial council of Rhode Island has recommended that rule-making powers be conferred upon the courts and Governor Case of that state, in his message to the legislature of 1930, requested that careful consideration be given to this recommendation.

State Judicial Council.—Probably the most promising current movement for judicial reform is the rapid development of state judicial councils. Twenty states altogether have now created these bodies. The second annual session of the National Conference of Judicial Councils was held at Chicago in August, in joint session with the judicial section of the American Bar Association. At this conference it was brought out that the work of judicial councils in most states may be classified into four divisions, namely, collecting data, rule-making, administrative control, and making recommendations.

New Jersey Judicial Council.—By an act passed at its 1930 legislative session, New Jersey becomes the twentieth state to establish a judicial council. This body is to consist of a permanent commission of fourteen members, of whom the attorney-general is a member *ex officio*. The other members are one of the vice-chancellors, to be designated by the chancellor; a justice of the Supreme Court, two circuit court judges and a common pleas judge, to be designated by the chief justice; and the president of the state bar association, the chairmen of the judiciary committees of both houses of the legislature, and five members of the bar, to be designated by the president of the state bar association. It is the duty of the council to make a continuous study of the state judicial system and to make suggestions for its improvement.

Ohio Judicial Council.—The first state judicial council was established in 1923 in Ohio. Under the auspices of, and in coöperation with, the Ohio Judicial Council, the Institute of Law of Johns Hopkins University has recently undertaken a significant and important investigation of judicial administration in Ohio. This undertaking contemplates the formulation of an adequate system of judicial statistics and an analysis of litigation in various courts of the state, including the common pleas courts, the municipal courts, the court of appeals and the supreme court.

Illinois Judicial Council.—The Illinois Judicial Council, established in 1929, has formulated an ambitious program to be presented to the legislative session of 1931. It includes complete renovation of the Illinois criminal code, with a modernization of legal procedure to speed justice and make punishment more certain. These recommendations are based in part upon observations made during a trip to study the courts of leading Canadian and American cities.

THE JURY SYSTEM

Eligibility of Women.—Governor Allen of Massachusetts, in his message to the General Court of 1930 recommended the amendment of the statutes on jury service to permit women to serve on juries. In Illinois, the question as to whether women should be allowed to serve on juries was submitted to popular referendum and carried by a substantial majority. Women are already serving on juries in that state and in a considerable number of other states.

Waiver in Felony Cases.—In Illinois the supreme court in a recent decision held that the right to trial by jury may be waived in felony cases, and it is estimated that this ruling will cut the time for criminal cases at least one-third, thus releasing judges, especially in Cook County, to the crowded civil dockets.

COUNTY AND RURAL GOVERNMENT

By Orren C. Hormell

Professor, Bowdoin College

COUNTY GOVERNMENT REFORM

Investigation.—Countrywide interest in the reform of county government increased during 1930, though there were no striking additions to the statutory provisions relating to the county. The chief contribution to reform of county government came from investigations carried on either by private or by public commissions. Such investigations, in the main, aimed for restriction in the cost of government, general fiscal reform, simplification and centralization in the form of government, county consolidation, city-county consolidation, and regional planning.

Fiscal Administration.—In the field of administration of county fiscal affairs, North Carolina and Virginia reported continued progress in installing better financial systems, as outlined for North Carolina under the Fiscal Control Act of 1927, and as inaugurated for Virginia by the National Institute of Public Administration in 1928. (See American Year Book, 1929, p. 102.) The Iowa County Budget Law deserves mention among the fiscal reforms in other states. During 1930, in pursuance of the legislative enactment of 1929 sponsored by the Des Moines Bureau of Municipal Research, Polk County instituted a modern budget system. Unfortunately, the bill was made applicable only to counties having a population of 125,000 or more, which limited application to Polk County, in which Des Moines is located. The budget system was installed under the direction of the state budget director, who assisted the county officials in setting up the budget forms and aided the departments in compiling budget requests.

COUNTY REORGANIZATION

Westchester County, New York (see American Year Book, 1929, p. 101) maintained a position of interest in the field of county reform, though the county still refused to adopt a new charter in pursuance of the New York constitutional amendment applying to Westchester and Nassau Counties (see American Year Book, 1928). The Westchester County Research Bureau, early in the year, proposed a new charter for the county giving the county council powers similar to those of the Board of Estimate of New York City. The members of the council were to be elected at large rather than from the several districts of the county. The council, in turn, was to appoint a county manager in charge of public works and public welfare. The appointment of the commissioner of finance and of the county attorney was also to be vested in the council. The proposal would separate administration from legislation, since the board of supervisors representing the several districts of the county would still be the legislative body. The proposed charter, with recommendations of the research bureau, was not adopted, largely because of the attitude of the Republican organization which asserted that much in the way of consolidation and effective coöperation had been secured without a charter.

Centralization, it appears, has been accomplished to no small degree in Westchester County. Several committees of the board of supervisors have been abolished and their powers centralized under the committee on the budget and appropriations. This committee has sole power to introduce appropriations to the board. Health administration, poor relief, and probation of offenders recently have been consolidated into a county department of health, a county department for the relief of the poor, and a county probation department. The probation department consists of a director, a deputy director, and 15 probation officers. A movement is on foot to consolidate assessment and taxation by transferring the powers exercised by the 18 towns to a county commission on assessment and taxation at White Plains. Recreation, highways, and sewer departments have already been created which extend throughout the county. The park commission has developed a vast system of public parks. The Westchester County Planning Federation has been organized, including four cities, 14 villages and one town, which advocates countywide zoning ordinances, comprehensive regional planning and uniform building codes. The law of 1929 permits the municipalities to include in the budget sums to meet the expenses of maintaining a planning association within any county where there is no regional planning board.

Ohio.—Statewide sentiment in favor of modernizing county government was created in Ohio through the coöperation of the Ohio Chamber of Commerce and the Regional Government Committee of Cuyahoga County. A committee has been drafting an amendment to the constitution which, it is believed, will provide for the modernizing of the county government in general and for the needs of metropolitan counties in particular. Charles P. Taft, 2nd, of Cincinnati, chairman of the drafting committee, was assisted by Dr. S. Gale Lowrie and Emmett L. Bennett of the University of Cincinnati, and C. A. Dyer of the Ohio state grange. If such an amendment is passed provision undoubtedly will be made for a regional or metropolitan form of government for Cuyahoga county, including Cleveland.

California.—A commission appointed by Gov. Young was organized Feb. 22 for the study of county home rule. This commission has conducted a study on the question of home rule and local autonomy for California counties, and is authorized to report its findings and recommendations to the next legislature.

MODEL COUNTY MANAGER LAW

The outstanding event in the field of county government during the year was the publication of a model county manager law (see AMERICAN YEAR BOOK, 1929, p. 100). The law is the result of more than a year's intensive work performed by 14 of the country's outstanding authorities on local government. Prof. John A. Fairlie of the University of Illinois, was chairman of the committee and Paul Wager of the University of North Carolina, the secretary. The law classifies the counties into rural, urban-rural, and urban. The legislative power is to be centralized in an elective board or commission. A board of seven members is recommended for an urban county, and a board of three to five for the urban-rural and rural counties. A clear distinction is made between the policy-determining and administrative powers. For the carrying out of the administrative powers the board is authorized to employ a county manager and fix his salary for an indefinite term. His duties are: appoint and remove all subordinate officers and employees; to be the administrative head of the county; prepare the annual budget; make regular reports to the board and provide them with information; supervise assessment of property, collection of taxes, custody of public funds, pur- the buildings and other property, con- chases for all departments, care of struction and maintenance of highways and bridges, employment of prisoners, care of the poor, operation of charitable and correctional institutions, public health administration, and any other business which may be delegated to him by the county or by the state. It was the purpose of the drafting committee to make the provisions of the charter flexible enough to meet diverse conditions in the several sections of the country.

No state has yet adopted in its entirety the fundamental principles of the manager system. However, five counties in North Carolina and five in Virginia (see AMERICAN YEAR BOOK, 1929) have chosen county executives possessing many of the powers suggested in the model charter. The publicity now being given to these experiments (see W. Kilpatrick, *Problems in Contemporary County Government*), and the publication of the model charter should be a positive factor in encouraging throughout the county reforms in county government.

CITY–COUNTY CONSOLIDATION

Pittsburgh.—After the failure of the Federated Pittsburgh Plan to receive the requisite majority in June, 1929, the Metropolitan Plan Commission recommended that the county commissioners of Allegheny County should resubmit to the electors of the county in its original form the charter for the consolidated City of Pittsburgh. The commission believed that the county commissioners had such a right under the constitutional provision of 1927. The county commissioners, following the suggestion of the Metropolitan Plan Commission, adopted a resolution for the re-submission of the charter to the electors Nov. 4, 1930. An injunction was secured against the expenditure of the money for such an election. The Supreme Court of Pennsylvania on March 17 handed down a decision in the case of O'Connor *v.* Armstrong, 149 Alt. 655, holding that the constitutional amendment did not give the county commissioners any such authority without further authorization by the legislature. The re-submission of the charter to the electors depends therefore on the attitude of the Pennsylvania legislature.

St. Louis.—The outstanding attempt during 1930 for a city-county consolidation was formulated in an amendment proposed to the constitution of Missouri enabling the voters of St. Louis and St. Louis County to adopt a charter creating the city of Greater St. Louis. First a survey was made under the direction of Prof. Thomas H. Reed of the University of Michigan. The constitutional amendment granted power to the people to consolidate the city and county into a city, with the proviso; first, that the incorporated cities, towns and villages in the county of St. Louis should be designated as a municipal district of Greater St. Louis; and, second, that the unincorporated remainder of the territory of the county should be incorporated into a county district in Greater St. Louis. The amendment vested in the consolidated city and county those functions which by their nature are of county-wide interest, while distinctly local functions were vested in the several municipalities and county districts within the consolidated city and county. St. Louis approved the amendment by a vote of 63,253 in favor to 58,683 against. The amendment however, failed to receive the required majority in the statewide vote.

COUNTY AND REGIONAL PLANNING

New Jersey.—The New Jersey State Regional Planning Commission of 11 members created by the legislature in 1929 "to study and report to the next legislature upon a plan or plans to carry out and administer intermunicipal, intercounty and interstate projects" was continued (Joint Resolution No. 7, April 18, 1930), and authorized to report to the legislature in 1931. The recommendations of the commission contained in its report to the Governor, March 18, were considered by the legislature, but final action was postponed until further information and more carefully prepared proposals could be submitted by the commission.

New York.—A regional planning conference was held at Albany, Sept. 18. Plans were then made for a permanent planning organization or federation to include Albany, Schenectady, Rensselaer, and environs.

California.—During the year the California County Planning Association came into being. Members of the several county planning commissions are eligible to membership in the Association. The county planning law of 1927 permitted the creation of planning commissions by the counties. The law of 1929 made the creation of such planning commissions mandatory. The aim of the Association is to secure the coöperation of all of the county planning commissions.

MOVEMENT FOR RURAL CONSOLIDATION

There is a growing realization that the small rural community has no chance for the development of well rounded community life. Dr. C. J. Galpin, of the U. S. Department of Agriculture, at a meeting of the American Country Life Association in Madison, Wis., proposed to consolidate the farming communities or unite them with villages and towns in rural sections in order that the tax-producing property would be sufficient to support schools, libraries, hospitals, recreation, etc. It is interesting to note here that the experience of the New England town where the rural and urban sections have been united from the beginning, may be called upon for guidance if such a movement should gain recognition outside New England.

The abolition of rural towns and their consolidation with more prosperous adjacent areas was advocated by Ralph T. Compton in a special report of the New York State Tax Commission on *Fiscal Problems of Rural Decline.* Tax administration and protection and welfare functions now exercised by towns, the author believed, should be centralized in the counties.

SOCIAL AND ECONOMIC VENTURES

New York.—An advanced program in the field of social betterment was instituted in Westchester County during the year. An unusual service for a county to perform was inaugurated for old-age relief. A staff of 12 members was created with a superintendent, supervising agent, six agents for conducting investigations, three stenographers, and secretary. These positions were filled by civil service examinations. Information with regard to the poor over 70 years of age and without relatives has been collected by this staff and the actual extending of relief was scheduled to begin Jan. 1, 1931. The Westchester County recreation committee has inaugurated an extensive program for musical performances at the $1,000,000 county center on the Bronx River Parkway west of White Plains. There were operas, Sunday organ concerts and athletic tournaments.

Georgia.—An interesting experiment, first of the kind instituted by an American county, it is asserted, was put into operation in Crisp County, Aug. 1, when a county-owned and county-operated hydro-electric plant began the generation and transmission of electricity made possible by a constitutional amendment authorizing issue of bonds in excess of the constitutional debt limit. The bonds are a general lien on all properties of the county and a special lien on the actual properties acquired by the proceeds of the bonds. Administration of the enterprise is vested in a power commission of seven members.

COGNATE SOCIETIES

American Constitutional League, 27 William Street, New York City.

American Defense Society, Inc., 154 Nassau Street, New York City.

COGNATE SOCIETIES

Civil Service Forum, 1756 46th St., Brooklyn, New York City.

National Assn. for Constitutional Government, 716 Colorado Bldg., Washington.

National Civil Service Reform League, 519 Fifth Ave., New York City.

National Municipal League, 261 Broadway, New York City.

National State Assn., 644 Drexel Bldg., Philadelphia, Pa.

Voters' Educational League, 524 First Avenue, New York City.

DIVISION V

MUNICIPAL GOVERNMENT

CITY POLITICS

By Clinton Rogers Woodruff

Honorary Secretary, National Municipal League

NEW YORK

Judicial Scandals.—A series of scandals have developed in New York that have excited widespread discussion and led to serious investigation. The president of the Borough of Queens, Maurice E. Connolly, has been jailed for fraud in connection with sewer-contracts; a judge of the General Sessions Court, Francis Xavier Mancuso, has been forced from the bench for lending his name, in which the Italian population put great store, to a shady trust company, which failed; the State Superintendent of Banks, Frank H. Warder, was dismissed because of the failure; another judge, Albert G. Vitale, had been discovered consorting with crooks and gamblers and was removed from office; the chief probation officer of the State General Sessions Court, Edwin J. Cooley, was suspended from office and indicted for favoritism and misappropriation of funds and resigned in disfavor, although later the grand jury ignored the bills against him; a Kings County judge, W. Bernard ("Bernie") Vause, was sentenced to six years in jail for stock-swindling by mail with Columbia Finance Corporation, a pseudo-bank into which many poor people put their savings; the Public Administrator of Staten Island, James W. Hennessey, was indicted for a $35,000 deficit in his accounts; Judge George F. Ewald of the Traffic Court, prior to being suspected of job-buying, was indicted for selling stock by mail in Butte Copper Mines, Inc., a company whose real holdings were said by United States agents to be "nothing but a hole in the ground." He resigned from the bench. The Appellate Division of the Supreme Court and the Bar Associations have moved in the matter. Samuel Seabury, a former judge of our Court of Appeals, was named Referee by the Appellate Division to conduct the investigation, and Isidor J. Kresel, who conducted the Ambulance Chasing Inquiry, was named by the Presidents of the Association of the Bar, the New York County Lawyers' Association and the Bronx County Bar Association as counsel for Judge Seabury.

Ewald Case.—Governor Roosevelt called an extraordinary term of the Supreme Court in August, designated Justice Philip J. McCook to hold the term and impaneled a grand jury and directed the Attorney General (Hamilton Ward) to attend before the Grand Jury and conduct the case of George F. Ewald, who had been indicted in the Federal Courts for fraudulent practices in connection with the sale of stock of a worthless corporation and who had resigned his office as City Magistrate. The District Attorney of the County, Thomas C. T. Crain, had taken the Ewald case before the regular grand jury, which failed to indict. The charge was that Ewald had purchased his nomination. The public was greatly aroused and it was for that reason that Governor Roosevelt called the extraordinary Grand Jury and superseded the District Attorney by the Attorney General. Under the law an extraordinary grand jury has all the powers of an ordinary one and t can inquire into any crime whatso-ver; but the Attorney General is imited by the orders of the Governor and Governor Roosevelt specifically imited him to the Ewald case. Judge McCook in his first charge told the grand jury if they found reason to believe that there was a system under which sales of judicial office were made they could go into it and they have gone into it to an extent. A week or more ago the grand jury came in and asked Judge McCook whether they could go into certain other cases affecting nominations and appointments to the Bench. He replied that they could but that the Attorney General was limited.

CHICAGO

The Zuta Disclosures.—Chicago continues to be the centre of gang feuds and elaborate, carefully organized grafting undertakings. The details of this development are numerous, one of the outstanding events of the year 1930 being the death of one Jack Zuta, known as a "gangster," who kept books showing the amounts of money which he paid out or loaned. Among the disclosures were the following: Notes and checks for $5,500 bearing the name of a former municipal judge; check for $250 made out to a former superior court judge; two checks, each for $200, and each made out to a state senator; letter bearing the name of an Evanston police official, asking for a $400 loan; note for $600 bearing the name of a Chicago police sergeant; jail courtesy card, made out to Zuta and signed by a former sheriff; another item called "East Chicago," showing a payment of $3,500, is believed to refer to the police district just north of the river, according to the *Chicago Daily News*.

Killing of Journalist.—Another outstanding event was the shooting of a journalist in a public place on June 9. It is understood that this man was in possession of information which was considered dangerous to certain of the criminal elements. Notwithstanding the outcry following this public assassination, and a change in the police officials, nothing substantial seems to have been accomplished.

DETROIT

Recall of Mayor Bowles.—Elected mayor of Detroit on the advance assumption that he was "honest even though inexperienced in municipal affairs," (See AMERICAN YEAR BOOK, 1929) Charles Bowles, who had campaigned for the office five years and been repeatedly defeated, began his administration in January, enjoying the good will of practically all public agencies, civic organizations and political factors. A combination of vicious influences, evidently taking advantage of the mayor's inexperience, gradually assumed control of his administration. So many flagrant errors of judgment followed, including discharge of appointive department heads, that according to W. P. Lovett of the Detroit Citizens League, a movement under Michigan law to recall him from the office of mayor became a dominant issue. Citizens of prominence, recognized as independent politically, remained aloof, waiting to see the result of the legal controversy over validity of the recall petitions.

Unprejudiced Detroiters felt that the political welfare of the city hung in the balance. It seemed generally accepted that Mr. Bowles' inexperience had been fatal to his administrative success, but no outstanding citizen appeared who was willing to accept the hazard of a recall election under the bitterly controversial conditions which prevailed. On July 22 the people voted by a majority of 30,956 to recall Mayor Bowles. Under the state law he became automatically a candidate at a special nonpartisan election held September 9, the day of the partisan primary. Three other candidates ran against him.

New Elections.—*The Free Press, News, Detroit Saturday Night*, the Detroit Citizens League and many other agencies endorsed George Engel, personally the best qualified man. Former Mayor, John W. Smith, Frank Murphy and Mayor Bowles were the three other candidates. The vote at the election, Sept. 7, was: Murphy, 106,203; Bowles, 93,772; Engel, 85,556; Smith, 21,608; Raymond (Communist) 3,542.

READING

The consensus of opinion in Reading, Pa., is that the Socialists are giving, on the whole, a most satisfactory administration. The Commissioners are honest, upright men, and are making a worthy effort to carry on the work of municipal government along sane and sound lines. Both Democrats and Republicans are willing to concede this point, and it is generally believed that unless the old parties forget their feuds and enter into some sort of alliance, the Socialists will be returned to power when the elections come up two years hence. There is no trace of graft or corruption. They are radical in no sense of the term, and do not attempt to put over or put through radical legislation. They are simply another political party in the field, somewhat conservative in tendency and without any desire to wave the red flag. They are discovering, however, that improvements cannot be made without money, and the tax rate is steadily increasing. This will not be forgotten, and it may be that this will be counted against them, when the date of another election approaches. Outside of Reading, however, things do not look quite so bright. The town is being labelled throughout the country as Socialist, and business enterprises that under different circumstances might establish branches refuse to come near the place. It is being alleged by the leaders in industry that Reading is losing the confidence of the business world, as no company wants to establish a plant in a town that may be led to pass legislation against its best interests.

SCRANTON

Edward B. Jermyn, twice Mayor of Scranton (1914-1918, 1926-1930), was convicted of graft and bribery and sentenced to a year in prison. During his last year in office there were ugly stories of graft and bribery in connection with police protection for certain gambling slot machines. A grand jury investigated and found that racketeers were paying City Hall officials for this protection. In the spring of 1930 a Lackawanna County jury convicted him, his cousin, and various others, of conspiracy. One of the racketeers testified that he paid $4.00 to a machine for protection and that his monthly payments averaged $3,000.

TYPES OF MUNICIPAL GOVERNMENT

BY CLINTON ROGERS WOODRUFF

HONORARY SECRETARY, NATIONAL MUNICIPAL LEAGUE

COUNCIL-MANAGER CHARTERS

Adoptions.—In 1930, the following cities adopted council-manager charters: Arkansas City, Kan.; Bedford, O.; Borger, Tex.; Covington, Ky.; Dallas, Tex.; Fort Atkinson, Wis.; Lexington, Ky.; Mamaroneck, N. Y.; Newport, Ky.; New Rochelle, N. Y.; Oakland, Calif.; Shawnee, Okla.; Teaneck, N. J.; Ventura, Cal. Two cities—Wilmette, Ill., and Phoenixville, Pa.—adopted the plan by ordinance. Jan. 1, 1930, the plan went into effect at Ironton, Piqua and Portsmouth, O., the charters having been adopted in 1928.

Rejections and Abandonment.—The following cities defeated the manager plan or manager charter: Appleton, Wis.; Hookset, N. H.; Klamath Falls, Ore.; Marinette, Wis.; Metuchen, N. J.; Milford, N. H.; Monroe, Mich.; Nanaimo, N. C.; Owosso, Mich.; St. Paul, Minn.; Watertown, Wis. The votes at Milford and Hookset, N. H., were at town meetings. June 16, 1930, La Peer, Mich., abandoned its council-manager charter.

Official List of Cities.—The International City Manager's Association maintains an official list of city manager cities to which the following cities were added during the year: Shawnee, Okla.; Mamaroneck, N. Y.; Borger, Tex.; Wilmette, Ill.; Phoenixville, Pennsylvania, and Teaneck, New Jersey.

APPOINTMENTS AND PROMOTIONS

From Nov. 1, 1929, to Aug. 31, 1930, there were forty-seven new city manager appointments, and forty-one men left the profession during the same period. In addition, fifteen city managers received promotions and one city to another, the eight former managers received new appointment, and one assistant was appointed manager.

Results in Dallas.—The plan was approved by a two-to-one vote in Dallas, which, with its population (1930) of 260,397, is the second largest city in Texas and is now the largest city-manager municipality in the Southwest. The victory for the council-manager plan is particularly the result of an 18-month campaign by the Citizens' Charter Association, carried into the residential and industrial neighborhoods by speakers, many of whom were young lawyers and business men.

SPREAD OF CITY MANAGER PLAN

Dayton.—In his review in *The American City* of the rise and spread of the city manager plan, Richard S. Childs, president of National Municipal League, called attention to the fact that the early triumphs of the plan in Dayton under the brilliant four-year administration of H. M. Waite have been repeated in numerous cities and have "stayed put" in Dayton itself, where for seventeen years the administration has remained on a merit basis untouched by politics and unthreatened at elections. The old saying that "a reform administration is never reëlected" is all but reversed in the experience of the city manager towns.

Professional Aspects.—The city managers constitute a distinct profession now, holding annual three-day conventions, publishing their own *Public Management* magazine and remaining keenly receptive to ideas for advancement of administrative technique. They are the first municipal chief executives who have had any reason to be interested in learning their jobs and becoming experts, for they can hopefully consider this profession as a lifetime career, inasmuch as they are, like school superintendents, able to move from city to city, advancing to larger opportunities and large salaries. Over a hundred of these managers are in their second city, several are in their third or fourth, and one is in his fifth.

Limitations.—Mr. Childs' disappointment about this record of progress is that the new city manager governments with their steady efficiency have not been made use of to advance confidently into new and more difficult realms of common service. They have only taken on the usual duties and averaged better in doing them. One Texas city manager, to be sure, has taken on the whole function of charitable relief, but such imagination is exceptional. They are doing no pioneering; they just save taxes and lower death rates and keep the grafters out. Of course there has been a war and a reaction against progressivism, and a disinclination to embark in new adventure. Perhaps it would still be premature for the voters to trust these new governments with new burdens like running bus lines or delivering milk. But he shares the disappointment which the Socialists of Dayton expressed when the new government declined to take over the street-car lines.

Public Opinion.—*What Those Who Live in Manager Cities Think of Their Government* is the title of a pamphlet based on opinions obtained by the National Municipal League from questionnaires sent to "leaders of public affairs in manager cities throughout the country." The comments, with a line giving the occupation of each individual quoted, are listed alphabetically by states and cities, the population of each city and the date of its adoption of the manager plan being indicated in the margin. A summary of the opinions of chambers of commerce and others, in a limited number of cities in which the city manager plan is operating, on the success or failure of this form of municipal government in these communities, was published by the U. S. Chamber of Commerce to meet the increasing number of requests for such information. A list of pamphlet material on the plan, a directory of city manager cities, and their managers, and a list of cities which have abandoned the plan are appended.

CONDITIONS AND OPERATION

Cleveland.—After six years of noteworthy administration, Manager William R. Hopkins was unceremoniously removed from office through political influences. Cleveland is the largest city to have adopted the manager plan. Four times the opponents of the plan have sought to persuade the electorate to repudiate or weaken it at the polls, but on each occasion have failed. It will be instructive to watch the outcome of the present flank attack, although Mr. Hopkins' successor is highly spoken of by the Citizens' League.

Stevens Pt. and Sacramento.—There were similar displacements of existing managers in Stevens Point, Wis., and Sacramento, Calif. All of these cases are family fights in the opinion of *The American City,* in which an outside opinion would be as unwise as it would be unwelcome. It is understood, however, that the men chosen to displace the former incumbents are men of high character and proved ability. It is significant that when a city council does upset a sitting manager, it is careful to replace him with a man whose qualifications command local respect.

Kansas City.—The only particular change during the past year is that the partisan control is more riveted on to the city than ever before. At the first election under city manager government the Republicans elected the mayor and three of the councilmen. The Democrats elected the other five councilmen and so had control of everything except the Park Board and the Police Department. The Park Board is appointed by the mayor and as the first mayor was a Republican it was a Republican Park Board. At the election in 1930, all the Democratic candidates were elected and the principle "to the victors belong the spoils" went into full operation. Two of the three members of the Police Department are appointed by the governor. Therefore the Republicans have control. The mayor is the third member of the Police Department and is its presiding officer.

INTERNATIONAL CITY MANAGERS' ASSOCIATION

The seventeenth annual meeting of the International City Managers' Association was held in San Francisco, Sept. 24-27 inclusive, with well over 100 in attendance. Effective committee work has been carried on during the year, with the publication of a report on the qualifications and training of a city manager, and the revision of the constitution, raising the standard for active membership by increasing the length of service from one to two years, and placing this membership classification upon professional conduct. President Stephen B. Story, in his annual address, reviewed briefly the progress made in the field of public administration during the past year, and emphasized the need for a fuller coöperation between universities and administrators to the end that the efforts now being put forth in the training for a career in the public service be more fully realized. Secretary Clarence E. Ridley reported that at present there are 403 council-manager cities in the United States, 15 in Canada and 2 in Ireland; that one out of every six cities of over 100,000 population in the United States is now operating under the plan; that twelve cities have been added since the last convention, in November, 1929; that Oakland and Dallas would vote on council-manager charters before the end of the year; and that San Francisco, Philadelphia and Detroit were manifesting considerable interest in the plan. A net gain in membership of 24, and an increase of 20 per cent in the circulation of *Public Management,* the official journal of the Association, were also reported. The report of the research committee announced the award of two traveling fellowships during the year, the establishment of a permanent research staff in connection with the publication of a report entitled "Measurement and Control of Municipal Sanitation." The newly elected officers, chosen at the closing session, were Stephen B. Story, Rochester, N. Y., President; and Clifton E. Hickok, Alameda, Calif.; Adam R. Johnson, Austin, Texas, and John P. Broome, Summit, N. J., Vice-Presidents.

MUNICIPAL FUNCTIONS

By Clinton Rogers Woodruff
Honorary Secretary, National Municipal League

FIRE PROTECTION AND PREVENTION

General Progress.—There is a growing interest in the question of fire protection and prevention on the farm and in rural communities. The Committees on Farm Fire Protection of the National Fire Protection Association and of the National Fire Waste Council have been active. The Conference on Spontaneous Heating held in Washington was also a valuable contribution in this field. Similarly, there has been a considerable development in the study of fire protection and prevention in the field of aviation. The work of the National Fire Protection Association Committee on Aviation is a valuable contribution to this subject. The hangar tests carried out in Washington by the Government in coöperation with other agencies were of great value. The development of the idea of state fire colleges sponsored by various state universities for the benefit of firemen throughout the state is a useful one. A number of states are now carrying out such programs regularly each year. The effect of this work in improving the personnel and spirit of fire departments should be very good. During 1930 much has been done to take care of the hazard of film in hospitals and other institutions. This was the logical development following the disastrous Cleveland Clinic fire. There has been a large increase in the use of safety film for *x*-ray work. For three years an active campaign has been in progress to standardize the arson statutes in the various states of the Union. The model law, promulgated by the Fire Marshals Section of the National Fire Protection Association, has now been adopted in twenty-seven states in which under its provisions it is now considered arson for a man to burn his own property as well as the property of another.

Hospital Inspection.—An outstanding development in the field of Fire Prevention throughout the country during 1930 has been the inspection of hospitals by the National Board of Fire Underwriters and the associated boards and bureaus of the stock fire insurance interests located in the various states and cities. This hospital inspection work was instituted as a nation-wide plan by the National Board of Fire Underwriters and endorsed by the leading national medical and hospital associations. As a result of the more than 2,000 reports which were made, a number of older hospitals have plans for the complete rebuilding of their plants, and others have arranged for changes and additions which will tend largely to prevent the injury of patients from fire causes. As a subject allied to the general inspection of hospitals, another outstanding feature has been the general adoption of cellulose acetate or safety base *x*-ray film for use in these hospitals. With safety film substituted for the readily inflammable nitrate stock, there will be little chance of a repetition of a fire such as occurred at the Cleveland Clinic.

Automatic Sprinklers.—After several years of study and a series of tests, it has been found that adequate protection can be furnished in many classes of occupancies which have a low combustibility factor by the use of an automatic sprinkler system built along requirements somewhat less severe than those which have been used in the past. This type of sprinkler system is now covered by regulations issued by the National Board of Fire Underwriters and is known as "Class B Sprinkler Equipments." The wide interest in aeronautics has resulted in the construction of numerous airplane hangars, factories, repair shops, and other structures in connection with this industry. As with all other new industries, the lack of funds has resulted in many of the buildings, in connection with the industry, being constructed in a manner which makes them ready fuel for fires. A series of tests conducted in Washington has indicated that these buildings can be protected by the installation of automatic sprinklers and that the planes and other contents of the buildings, which may be ignited, can be extinguished before very extensive damage has been done or at any rate before the fire has spread to other planes. This method of airplane hangar protection has emphasized the use of thermal release devices on piping systems installed on the ceiling and on the floor for the quick application of water to open orifices. The thermal operation of systems for the application of water is not new as it has been used for a number of years in connection with various hazardous processes but its development in the past year has been rapid, particularly in the automobile field in connection with protection where spray painting is carried on.

Boston Fire Survey.—A fire survey of the City of Boston has been made at the instigation of the public authorities by the Albert Russell Erskine Bureau of Harvard Univeristy. The engineering section was made by the field engineering departmen of the National Fire Protection Association. The Report contains 134 pages. It is a reprint of an illustrated article on "Fire Protection Engineering as Applied to Municipalities" in the April number of the *Journal* of the Boston Society of Civil Engineers. The article consists of a paper presented by Kenneth F. Akers at a meeting of the Society, and the subsequent discussion. Mr. Akers described the survey, of which he was associate engineer, made by the Erskine Bureau and the Field Engineering Department of the National Fire Protection Association, of the problem of fire waste and insurance rates in the city of Boston.

Salvage Instruction.—The International Association of Fire Chiefs is responsible for an enterprise that will result in a two-reel all-talking picture designed to instruct fire department employees and others in the modern method of salvage. A substantial percentage of the nation's fire losses is represented in preventable damages to property and goods by water, weather and other elements during and after fires. The production is sponsored by the National Board of Fire Underwriters and was supervised by Chief Ralph J. Scott, of the Los Angeles Fire Department, President of the International Association. The picture is the first of a series to demonstrate different branches of fire department and safety methods. Various organizations interested in fire prevention, safety equipment, etc., are financing the production. Different types of residences, warehouses, and factories figure in the first picture, being used to illustrate the coöperation between firefighters and the salvage corps in various situations, during a fire. The close coöperation between fire inspectors and the local salvage organization is also a feature.

Fire Training Convention.—During the week of May 5 twenty-one fire school instructors met in Albany, receiving an intensive training in the lectures and evolutions to be taught in the eighteen municipal zone fire training schools which operated during the summer in New York State under the direction of the New York State Conference of Mayors and the State Fire Chiefs Association. The instructors were trained to give lectures on courtesy of firemen to their superior officers and to the public, on fire prevention and building inspection, ventilation, care of fire-fighting equipment, hydraulics of fire streams, maintenance and operation of fire apparatus, salvage work, sprinkler systems, methods of fighting different kinds of fires, first aid and resuscitation, and use and care of gas and smoke masks. Instruction was also given in twenty-one standard evolutions. The discussion of special fire hazards was one of the lectures delivered in this training course. The six types of hazards covered were: inflammable liquids; dust hazards; chemicals; lint and combustible flyings; pyroxylin plastic; readily combustible materials.

Training Courses for Firemen.—The following cities are among those which maintain training courses for firemen in connection with their fire-departments: Boston; Buffalo; Chicago; Detroit; Kansas City, Mo.; Los Angeles; New York City; Philadelphia; Rochester; Seattle.

Fire Prevention Week.—By proclamation of President Hoover, the period from October 5 to October 11, 1930 was observed as National Fire Prevention Week. At that time, business houses and house-holders were asked to make a special effort to clean up rubbish and eliminate fire hazards of every sort, wherever they might exist. Fire prevention talks were given to employees.

Arson and Incendiarism.—No listing of fire prevention activities would be complete without some mention of the extensive work now being carried on and added to from year to year in connection with arson and incendiarism. There has been a marked awakening on the part of public officials as to their responsibility in connection with such work as it is recognized that the same class of criminals which is trying to defraud insurance companies is also committing other crimes which in any way will be a source of income to them. The extensive arson work of the National Board of Fire Underwriters and the allied work of the Life and Casualty Insurance Companies are going far towards restricting the operations of this class of criminal.

POLICE

Review of Progress.—In his reviews of the progress in police work in practice and theory during the past generation in the 21st Anniversary number of *The American City*, August Vollmer (Chief of Police in Berkeley, Cal., and Professor of Police administration in the University of Chicago) pointed out the change from brawn to brain, from illiteracy to scientific training. He called attention to the discard of heavy, lumbering, foot patrolmen for alert and fast motor-mounted policemen; the abandonment of guessing methods for the infallible finger-print identification system and a national clearing-house for criminal records; the giving-up of hit-or-miss traffic control for scientific engineering and mechanical appliances and principles; the forsaking of sidewalk tapping with clubs to attract the attention of officers on the beat for the modern visual and audible recall system; the rejection of mouth-to-mouth methods of transmitting messages to patrolmen, in favor of police radio communication; the change from no statistics whatsoever to a uniform crime record system operating under and controlled by the Department of Justice.

Quality of Police Service.—Comparing quality of service now given by an up-to-date police department with the police department in the politically ridden cities or held down by old traditions, is much like comparing modern civilization with the civilization of the Stone Age. The modern police department is an up-to-date business institution conducting its affairs on a solid business basis, and to the fullest extent utilizing principles of the several sciences and gradually developing principles peculiar to police service.

Use of Radio.—Forty or more police departments have recently installed radio transmitting stations, and thereby send out emergency calls to patrolmen patrolling beats in automobiles. Many criminals have been apprehended by radio-equipped policemen before they have had an opportunity to escape from the scene of their crime. Murderers have been caught, figuratively speaking, with the blood of the victim on their hands. From the time the message is received at the police station until the criminal is arrested, is frequently now a matter of seconds and not of minutes, hours or days as was true in the past. Signal lights, horns and bells and telephone alarm boxes are placed at strategic points in sufficient numbers so that a single police officer, or the entire force, may be communicated with and made instantly available when needed.

Crime Detections.—Scientific crime detection laboratories have been established in the police departments of several cities of this country, and some of the miracles performed by police laboratory technicians according to Chief Vollmer seem too wonderful to be true. There are many other aids recently developed, notably the Modus Operandi system devised by Atcherly. By the use of this system the manner in which the criminal operates is recorded in the reports of the officers, so that future depredations of the criminal are quickly identified as the work of a previous offender. Information acquired by officers is reduced to a code and then transferred by a punch to tabulating cards. These cards are filed according to the kind of crimes committed. When the perpetrator of the crimes is arrested, the several offenses for which he has been found to be responsible are connected by clerks. Later, when similar crimes are committed in the community and search is being made for the offender, the cards are run through a sorting machine by identification clerks. Those cards containing the same code or description of the same method of operation are separated from the rest. In this manner professional crooks are identified and their apprehension made easier. Information obtained from the officers' reports, which is transferred to the tabulating cards, has other values which are used to advantage by executives, such as the time of attack, the place of attack, and the type of crime committed. When it is found that the same offense is occurring with great regularity in the same area and at or about the same hour, special details of police are organized and placed on duty in these infested sections during the hours that the crooks are operating.

Fingerprint impressions are an invaluable means of identification, and the fingerprint system has come to be widely used in this country. Only very inferior or backward police departments fail to take fingerprints of criminals. Thirteen states have created central clearing-houses for these criminal records, and for the past seven years the Division of Identification of the United States Department of Justice has acted as a national clearing-house for fingerprint records. This Division has recently been legally established as a central receiving-station for all crime and criminal records.

Police Training Schools.—Twenty-one police training schools were in operation in New York State during 1930. New York City has a school for its own department. The State Training School for Police is operated by the State Police for troopers and any other police officials who desire to attend. Nineteen municipal training schools are under the supervision of an Advisory Council on Police Training representing the New York State Conference of Mayors, the State Police Chiefs' Association, the State Police and the Bureau of Social Hygiene. The cost of organizing the nineteen municipal schools and operating the school for instructors was again paid this year by the Bureau of Social Hygiene. The total expense was $3,423.49.

CHICAGO POLICE SURVEY

After an extensive survey of the Chicago Police Department, a Citizens' Police Committee, headed by Prof. Leonard D. White of the University of Chicago with Bruce Smith as Staff Director, submitted some timely and practical suggestions for the improvement of the police structure of that city. This reorganization plan, though it deals with one of the largest police systems in America, is based on principles that have application to much smaller police departments. The Chicago force, consists of no less than twenty separate and distinct offices, bureaus, divisions, or sections owing direct, administrative responsibility to the police commissioner. The highest police authority is therefore burdened with a task of detailed supervision greater than that of any of his subordinates and far exceeding the capacity of any one man. It is practically impossible for the police commissioner to make daily or intimate contact with the heads of the twenty separate units directly responsible to him. The situation is further aggravated by the location of the commissioner's office in the City Hall, more than a mile distant from police headquarters, where most of his immediate subordinates are located.

Structural arrangement of any administrative body is a matter of serious moment. The Committee pointed out that when the body in question is the police force of a great city, and comprises 6,000 men distributed over an area of 200 square miles, the question of organization assumes major importance. Efficient conduct of police operations clearly requires that the basic principles or organization be observed both in theory and in practice. These basic principles the Committee declared are three in number: Administrative leadership, which implies a unified command, exercised directly and continuously upon the several functions or services; Limitation in the number of major units so as to permit general supervision by the leader. While the number of such major units must depend, in some degree, upon the purpose and character of the organization, such units cannot be too numerous, or the leader will become entirely engrossed in detail; The grouping of related activities in such manner that a small number of bureau chiefs may exercise daily supervision under the general control of the administrative head.

Among the defects pointed out was the division of responsibility for traffic regulation between the traffic division, the motorcycle section, the vehicle section, and the 41 district commanders. The largest traffic problem of the city, represented by the central traffic zone, is handled as a mere adjunct to the work of the first division. Personnel matters are distributed among the drillmaster, chief surgeon, and first deputy commissioner. Property management and control are vested in the property section, first deputy commissioner, and department secretary. Similar conditions exist with respect to criminal records and criminal investigations. This scattering of responsibility for related activities has two immediate results. It prevents systematic planning and the economical use of man-power. The only possible coördinating influence is the police commissioner, already burdened with detail and too far removed from the scene of daily administrative action to exercise a decisive influence over more than a part of the administrative organization.

Three outstanding features of the Committee's report are: First, the number of units and individuals directly responsible to the police commissioner should be reduced from twenty to eight; second, the deputy commissioner should be relieved of minor and unrelated duties and constituted as a deputy in fact as well as in name; third, related activities should be grouped under definite supervision. The five major functions of the department should be allocated to a distinct unit, commanded by an officer directly responsible to the commissioner. Four bureaus should be set up, to deal respectively with personnel, crime detection, traffic, and records and property. To these should be added the fifth and largest of the major functions, namely, crime repression and prevention as represented by the uniformed force. Taken together, these suggestions embrace the entire rank of administration in any police force, whatever its numbers, constitution, or character.

MINNEAPOLIS POLICE SURVEY

In the survey of the Police Department of Minneapolis made for and pursuant to the authorization of the City Council, with August Vollmer as consultant, among the principal findings were that crime is a serious problem in Minneapolis, but exists to a less extent than in other cities, the most serious police hazard exists in the downtown precinct and in the lakes district; arson cases predominate within one mile of the center of the loop; the bulk of major offenses now are committed by juveniles; frequent changes of police administration set up cliques and periodically demoralize the department, and are fatal to efficient service and continuity of police policies and plans; too many small departmental units are directly under the supervision of the superintendent; the Police Women's Bureau should be developed as a coördinating agency for juvenile crime prevention.

Among the recommendations which the survey made were that the superintendent should be placed under civil service, with careful specification of duties; that patrols in cars should be a single officer not teams; that an officers' training school should be established; that advanced patrolmen's entrance requirements should be required; that intelligent selection by the superintendent by recognized tests of recruits, certified by the Civil Service Commission should be made; recruit training school; an equitable promotion scheme; increased pay rates in all ranks; one day off in seven for policemen; a number of patrolmen on intersection traffic duty be relieved by proper signal devices; that Minneapolis lends itself peculiarly to automobile patrol, except in the loop district; that duties other than patrolling beats deprive the citizens of Minneapolis of the police protection to which they are entitled, and waste man power; that motorizing the department may relieve the motorcycle traffic squad of men, who could be made available for a proposed reserve squad.

MUNICIPAL MISCELLANIES

BY CLINTON ROGERS WOODRUFF

HONORARY SECRETARY, NATIONAL MUNICIPAL LEAGUE

MUNICIPAL STANDARDS

National Committee.—The Julius Rosenwald Fund and the Local Community Research Fund of the University of Chicago made appropriations late in 1929 for a three-year period to extend the work of the National Committee on Municipal Standards. In January, 1930, Donald C. Stone, assistant director of the Committee on Uniform Crime Records of the International Association of Chiefs of Police, was employed as full-time director of the work. With the addition of secretarial services, the work is now progressing satisfactorily.

Chicago.—During the first three months of 1930, Bruce Smith, director of the Citizens' Police Committee of Chicago, was engaged in drafting a reorganization plan for the Chicago Police Department and in the installation of revised records and a communication system. These new records and communications are not only making it possible for Chicago to become an accurate reporting unit in the nation-wide system of uniform crime reporting devised by the Committee on Uniform Crime Records of the International Association of Chiefs of Police, but also provide the administrative officials with information necessary for effective planning and control of police operations.

Crime Returns.—Particular success has been obtained with council-manager cities. For example, approximately 67 per cent of those with over 10,000 inhabitants forwarded crime returns for March whereas only 48 per cent of the non-manager cities coöperated.

Street Sanitation. — Encouraging progress has been made in the work of developing uniform units of measurement and cost accounting for street sanitation. A tentative report on "Units of Measurement for Street Cleaning, Refuse Removal and Disposal," is being thoroughly revised and incorporated into a manual with complete instructions and forms for computing quantities and costs of sanitation work together with the means by which these computations can be converted into daily, monthly, and annual reports. The American Society for Municipal Improvements, the American Society of Civil Engineers, the National Association of

Cost Accountants, the American Standards Association, and other related organizations have been invited to coöperate in the undertaking. The committee of street sanitation officials formally adopted the following resolution as the basis for the undertaking: "The purpose of standard units and methods of reporting is first, to provide the sanitation administrator with the proper information to plan, supervise, and control the operation of his department; second, to furnish him with a factual basis for preparing budget and appropriation estimates; third, to supply him with a method of reporting his work to the public; and, fourth, to develop sufficient uniformity in reporting so that the administrator can compare his quantities, costs, and methods with those of other cities."

EDUCATIONAL MEASURES

Training of Officials.—As part of a program of the New York State Conference of Mayors and Other Municipal Officials, to provide training facilities for all groups of municipal officials in the state, a municipal training school for the financial officers of the cities and villages of New York State was held in Albany on March 20, 21 and 22, under the direction of the Bureau of Municipal Accounts of the State Department of Audit and Control and the Conference of Mayors. An intensive short course in the fundamentals of municipal finance was given.

Study of Municipal Problems.—Another forward step has been a plan whereby graduate students of the School of Citizenship, Syracuse University, will be assigned to the Bureau of Municipal Information conducted by the Conference, to study under the supervision of the Bureau of the University faculty certain municipal problems of state-wide importance. Four students have been assigned the following subjects by the Bureau; claims for damages against cities and villages; cost of insurance to municipalities; traffic violations; crime prevention work by police department. As a result of this plan the students will get the benefit of using all cities in the State of New York as a laboratory in which to work and the Bureau will get the benefit of their investigations and study. The report of each student will be submitted to a committee of experts appointed by the Mayor's Conference for criticism and revision, and then sent to all cities and villages in the state.

BILLBOARDS

Indiana Court Decision.—The Indiana Supreme Court on June 27, in the case of General Outdoor Advertising Company *vs.* City of Indianapolis et al., expressly recognized the evolution in the law relating to esthetic factors in modern urban development, and definitely declared that certain earlier decisions would never have been made had their cases been presented for the first time then. The specific ordinance upheld by the decisions was one adopted July 8, 1922, by the Board of Park Commissioners of Indianapolis, prohibiting the location or maintenance of any billboard or advertising device or structure, or the leasing of any premises for the purpose, within 500 feet of any park, parkway or boulevard, and directing that all such existing structures within the city be removed. No compensation may now be claimed for the removal of any board on land leased for its erection since the ordinance was adopted. Being illegal, such a board obtains no rights under the compensation clause. The Court said that the owner of protected boards "shall be paid due and full compensation at the fair present valuation of its existing business, boards, and leases for and during the term which they have to run." Under a liberalized construction of the general welfare purposes of state and Federal constitutions the Court held there is a trend in the modern decisions, which was approved to foster, under the police power, an esthetic and cultural side of municipal development, to prevent a thing that offends the sense of sight in the same manner as a thing that offends the senses of hearing and smelling.

This trend, however, must be kept within reasonable limitation, for citizens must not be compelled under the police power to give up rights in property solely for the attainment of esthetic objects . . . and under the law as it exists today esthetic or artistic considerations alone are not considered sufficient to warrant the exercise of the police power to prohibit advertising billboards generally throughout a city, because such considerations, of themselves, are not such a necessity as justifies the taking of private property without compensation. . . . But esthetic considerations enter in, to a great extent, as an auxiliary consideration, where the regulation has a real or reasonable relation to the safety, health, morals, or general welfare, . . . and where a regulation of billboards does not apply to an entire city, but merely applies to billboards in close proximity to public parks and boulevards, it may properly have a relation to the public health comfort and welfare which it would not otherwise possess.

Referring to certain earlier cases in Colorado, Illinois, Kansas, Massachusetts, New Jersey, New York, North Carolina and Ohio, including cases which held that billboards within given distances of parks and boulevards could not be prohibited, and the Court maintained that most of these cases were decided prior to the complete development of the law concerning the regulation of billboards, and all of them were decided prior to the decision of the many cases approving zoning laws. Recent cases have upheld zoning laws and ordinances and it is reasonable to presume that if cases wherein laws and ordinances sought to prohibit billboards within close proximity to public parks and boulevards were to be decided today in those states, they would reach the same result.

Garden Club Program.—A nationwide struggle to protect beautiful countrysides from billboards, is being made by the Billboard and Roadside Committee of the Garden Club of America. Many valuable suggestions for waging war against the billboards, because they disfigure the landscape and are a contributing cause for automobile accidents, are set forth in a report presented by the chairman of this national committee, Mrs. C. Oliver Iselin, of New York City, at the convention of the Garden Club of America, held in July in Seattle, Washington. In more than half of the states of the Union Mrs. Iselin reported thousands of signatures have been obtained to the following pledge:

"As a practical protest against the abuse of our countryside by advertising. I shall give special favor to products not advertised on the landscape."

New Jersey Law.—The women of New Jersey have set an example that deserves emulation, according to the report. Nine New Jersey garden clubs set to work to win the coöperation of other organizations and of influential citizens. The result was that the New Jersey Legislature passed a law which regulates and taxes billboards. The larger the billboard, the greater the tax per square foot in New Jersey. This is a powerful weapon for keeping billboards unobtrusive. Also, regulation is made possible to keep billboards well back from roadsides, to render them less painfully conspicuous and to lessen the danger that they will imperil lives by obstructing the views of autoists.

In Other States.—California is to have a "Master Highway Plan" allocating specified districts where billboards will be allowed for the special purpose of informing passing motorists regarding hotels, garages and service stations ahead. Mrs. Iselin's report commended Pennsylvania for what has been done in combining representation from various state-wide organizations into the Council for the Preservation of Natural Beauty in Pennsylvania. The Garden Clubs of Westchester County, New York, have brought about the removal of more than 5,000 illegally placed signs. In Kentucky, the women persuaded 258 firms that had been using billboard advertising to give it up. In Virginia drygoods firms were induced to remove 100 large billboards.

MUNICIPAL COÖPERATION

Ohio League.—At a meeting of representative city officials held at the Ohio State University on Friday, June 20, a temporary organization was formed looking toward permanent coöperation between the cities of the state. Mayor William T. Jackson of Toledo was elected president; City Manager F. O. Eichelberger of Dayton, vice-president; and Mayor Arthur T. Schuler of Bucyrus, Mayor R. O. Bryan of Portsmouth, and Mayor Homer M. Johns of Massillon, trustees. Prof. Harvey Walker of Ohio State University was chosen as secretary-treasurer and headquarters were established in the political science department of the University at Columbus. The officers constituted an executive committee directed to report a plan of permanent organization to a subsequent meeting held in Cleveland in November. The executive committee session, decided upon the following committees: 1. Uniform Traffic Code; 2. Uniform Crime Reporting; 3. Taxation; 4. Revision of the Municipal Code; 5. Legislation. Since under a decision of the Ohio Supreme Court cities may not legally pay dues in the general organization of municipalities, some enabling legislation must be secured before the League can be adequately financed. It was the unanimous opinion of those present at the Columbus meeting that such legislation should be presented at the 1931 session of the General Assembly. One of the tasks assigned to the new legislative committee will be that of drafting such a bill. The advantages of a league are so obvious that it seems unfortunate that so much difficulty has been encountered in the past in putting such an organization on a sound foundation. It can be done, but only with the whole-hearted coöperation of the cities. Pending action by the General Assembly upon this bill, every city in the State of Ohio will be considered a member of this organization and entitled to all its services.

Cleveland Conference.—In November, the National Municipal League, the Governmental Research Association, the Civic Secretaries Association, the American Legislators' Association, the Proportional Representation League and the Ohio Conference on City Planning met at Cleveland in an annual conference on Better City Government. The Executive Committee of the Ohio Municipal League called a general meeting of that organization at Cleveland on the afternoon of the last day of this conference. Recommendations of the Executive Committee for a form of permanent organization were adopted.

AMERICAN CIVIC ANNUAL

The second volume in the series of year books initiated in 1929 by the American Civic Association is a record of outstanding civic developments of varied character throughout the United States. The second volume quite equals the first in the variety and interest of its text and its illustrations. The contents are comprehensive in their scope and include: first, civic achievements of a national character, such as developments in the national parks, the housing problem and the Federal city; second, contributions describing the progress of the year in regional planning; third, what has been done by the states in such matters as planning, parks, roadside improvements and public building; fourth, civic progress in cities and towns in such matters as public structures of moment, planned college campuses, city planning, civic improvements.

METROPOLITAN AND REGIONAL PLANNING

By Charles William Eliot, 2nd.

National Capital Park and Planning Commission

GENERAL

Political boundaries of cities, counties and states have little or no relation to the growth, areas of influence and problems of conglomerations of population. New York lies in three states, Chicago in two, Philadelphia in three, while the commercial center that is Detroit extends its influence into Canada. Similarly agricultural areas with common crops and common problems of soil, markets and transportation often overlap political boundaries. When plans for the future are under discussion units or regions with common interests and common problems are more and more the basis for planning work rather than political jurisdictions.

Progress in regional planning is recorded in acceptance of the idea and necessity for the work, in the preparation of plans and studies, in the public interest and endorsement of proposals, and finally in the physical execution of projects. In all of these fields the year just closed has given encouragement to those who believe that forethought and hindsight should be applied to problems of regional development.

PLANS AND PROJECTS

Organizations.—According to the Division of Building and Housing of the Department of Commerce, there are now over 55 regional planning organizations in this country of which over 32 have an official standing as government agencies. The remainder are privately financed. Their activities range from publicity and political organization to the detail planning and execution of projects.

Washington.—Perhaps the most notable event in this field in 1930 and certainly the first in the new year was the presentation of the Regional Plan for Washington and its environs by the National Capital Park and Planning Commission in January. The necessity and advantages of regional planning were stressed by the President of the United States and the plan for the region about the Federal City was endorsed by the Governors of Maryland and Virginia. Congress in May gave its approval to the Regional Park System proposed in the plan involving expenditures of over $33,000,000. Substantial progress was also recorded in the Maryland and Virginia parts of the region through the work of the Maryland-National Capital Park and Planning Commission and the Arlington County Zoning Commission. The Virginia Legislature passed an enabling act for the organization of a regional planning commission in the Northern Virginia area adjoining Washington.

New York.—During 1930, the final Plan Volumes of the Regional Plan of New York have made their appearance, completing the 12 volumes of records and proposals resulting from over 5 years of intensive study sponsored by the Russel Sage Foundation. A new organization, The Regional Plan Association, carrying on the work and keeping the plan before the public has been seriously handicapped by the untimely death of its director, George B. Ford. A series of both official and unofficial planning organizations have developed in different parts of the New York area; in fact over 19 commissions and associations are now active as, for instance, the Westchester County Planning Federation, Passaic County Planning Commission and four other County organizations in New York, Connecticut and New Jersey; County Park Commissioners in Essex and Union Counties, N. J., and Westchester, New York; a special commission on the Hackensack Meadows and the Port of New York Authority, etc.

Philadelphia.—In the Philadelphia Region, the ambitious program of planning work laid out by the Philadelphia Tri-State Planning Federation is resulting in the development of an equally ambitious plan. Through the active cooperation of the local officials in all parts of the region, the needs and suggestions of local areas are being incorporated in the plan with consequent strengthening of support for the scheme as a whole. In this process, it is again natural that local planning organizations of more or less regional significance should develop as in Mercer County, N. J. The Philadelphia work, like that in New York or Chicago, is unofficial.

Chicago.—The Chicago Regional

Planning Association is active in an area of about 8,000 square miles and continues its past successes in coördinating the activities of county and municipal organizations within its field. On the north the area adjoins that in which the Milwaukee County Regional Plan Department is working.

California.—On the Pacific Coast, in California, a remarkable growth of over 13 county planning commissions is forming an almost continuous area of planning control or effort. The Los Angeles County Commission has been particularly active with publication of a weekly news-note and a Regional Plan of Highways. Such activities in the southern part of the state are of course not effective stimulants to the work of the Regional Planning Association for San Francisco Bay Counties.

Other Regions.—It is impossible in a brief review such as this should be to mention all the regions in which planning work is going forward. Records of official and unofficial work are available from Georgia, about St. Louis and East St. Louis, Louisville, Boston, Detroit, Minneapolis and St. Paul, Kansas City, Rochester and the Niagara Frontier Area in New York and about Cleveland, Cincinnati and Toledo in Ohio. The reports of the Department of Commerce show Oklahoma with three official commissions, and of course work going on in Pittsburgh, Seattle and other equally distant and diverse areas.

REGIONAL PLANNING CONSIDERATIONS

Discussion of Value.—The idea of regional planning is apparently sound; that is, if general acceptance is a guide, but the necessity of work in this field is not yet recognized if the present dependence on private initiative or inadequate public appropriations is a fair indication. It is natural and proper in a democracy that planning like other government functions should prove its value under private enterprise before being fully assumed by the public. City planning, including zoning, in the larger cities has already proved itself in this manner and it is reasonable to anticipate similar success for the movement to coördinate the planning activities of several governmental agencies in a single area regardless of political boundaries. The ideal of a single planning agency for the whole of any homogeneous region is certainly better served by division on county rather than town or city boundary lines, but the county or state lines are often as arbitrary and meaningless from the planning standpoint as are city lines. Regional Planning is a phase of regional government which has hardly grown beyond the "Metropolitan District" idea as developed in Boston forty years ago. Without growth of government organization, regional planning must depend on private enterprise.

The Outlook.—The self-contained area suitable for planning as a region has a way of constantly increasing in size. What was known as Town Planning soon became better known as City Planning. Then came Metropolitan Planning and County Planning with occasional State Planning efforts. The New York State Plan, the Michigan Land Economic Survey, the Massachusetts Open Space Plan, and other similar activities have shown the usefulness of planning work within state boundaries. But the Regional Plan ignores all political boundaries. The question arises: Are we coming to National Planning as a next step in the formulation of our planning ideals?

CITY PLANNING

BY FLAVEL SHURTLEFF

SECRETARY, NATIONAL CONFERENCE ON CITY PLANNING

LEGISLATION AND RESEARCH

New Jersey Act.—The New Jersey Legislature passed what planners generally characterize as the best city planning act to date. Closely following the Standard Act of the Department of Commerce, it authorizes planning commissions as official municipal departments and gives legal force to master plans when adopted by the planning commission. Under the New Jersey law, planning agencies are no longer merely advisory boards and plans are no longer interesting essays on municipal development. All public improvements are henceforth to be submitted to the planning commission. If the commission disapproves on the ground that the project is not in accordance with the adopted plan, it cannot be carried out except by a two-thirds vote of the governing body. The significant new chapter in the act is the provision for a large citizens group to aid the commission in its work and to interpret that work to the public. This clear recognition that plan making is a community undertaking is a commendable step forward. Paterson, one of the five large cities in New Jersey, and Montclair, one of the finest residential communities, have already appointed planning commissions under the act. Ridgewood, another fine residential town, has a master plan ready for adoption as soon as the official commission is appointed.

Publications.—*Airports—Their Location, Administration and Legal Basis* is the first publication of a series of studies by the Harvard School of City Planning. The authors are leaders in their fields: Henry Hubbard, Director of the Harvard School of City Planning, Miller McClintock, Director of the Erskine Bureau for Street Traffic Research, and Frank B. Williams, the author of *The Law of City Planning and Zoning.* The preparation of the second and third volumes in the series *Building Height, Bulk and Form,* by the late George Burdett Ford, and *Neighborhoods of Small Homes in America and England,* by Robert Whitten and Thomas Adams, has been finished and the volumes will soon be published.

CALIFORNIA REGIONAL PLANNING

California became alive with regional planning activity as the result of the act of 1929 which required all counties to appoint planning commissions. Although only 22 of the 58 counties have so far obeyed the mandate, most of the larger counties and all of the most populous counties are included, so that at least half the state's area and even a greater percentage of the state's population are now being served by regional planning commissions.

Los Angeles got an early start, and for several years has set the pace for her sister counties with an official planning program excellently organized and adequately financed. Its highway plan proposes, wherever the topography permits, major boulevards 100 feet wide, about a mile apart, and secondary highways 80 feet wide every half mile. Many miles of such boulevards and secondary highways have already been dedicated without cost to the county by owners of subdivisions through the efforts of the planning commission. It has also exercised a most needed and salutary influence on subdivision activity. In this connection the Map Filing Act, also passed in 1929, is proving very helpful. It compels subdividers to file a preliminary plan of every intended layout and punishes by a fine for each offense the sale of any land in a subdivision for which a map has not been filed. The planning agency is thus given a very much better chance to use persuasion with the subdivider.

The Santa Barbara County Planning Commission not only checks and approves subdivisions, but it states in each case its reasons for approval or disapproval, and gives the subdivision a rating. Subdivisions rated "D" are not approved. The Commission has established friendly relations with the real estate interests of the County and has so won their confidence that for the last two years practically every subdivision submitted has shown lots not less than 60 feet wide and not less than 6,000 square feet in area, instead of the 40 to 50-foot lots which were common in the past.

ZONING PROJECTS

Up to Dec. 1, 1930 at least 60 cities passed zoning ordinances for the first time. Among the published plans of the year should be noted particularly the plan for Knoxville with chapters on major street plan, transit and transportation, zoning, recreation, civic art, and parking and traffic regulations, and the major street plans for Louisville, Rochester and Boston. The Reconnaissance Survey for the Reading region is an interesting departure. It presents in fifteen readable pages with just enough illustration the basic requirements of a regional plan. Among the monumental projects which progressed during the year were the approaches on the New York and New Jersey side to the great Hudson River Bridge, and the completion of the work on the first link in New York's water-front viaduct from Canal Street to 23rd Street, a distance of 1½ miles.

ZONING

By H. M. Olmsted

Associate Editor, *The American City*

ZONING ORDINANCES

Increase in Adoption.—The regulation of the uses to which privately owned land may be put, by means of zoning, continues to spread and to present an interesting social phenomenon. The past year has added many cities to the list of those that have adopted zoning ordinances, under which the city's area is divided into zones or districts that are indicated for certain types of development and from which specific kinds of use are barred, and in which, in many cases, the height or bulk of buildings is restricted, and certain portions of lot areas must remain open.

Attitude of Leaders. — Equally notable as the continued additions to the ranks of zoned cities, and no doubt highly significant in accounting for this growth, is the emphasis on caution and reasonableness among the leaders of the zoning movement. Proceeding under the conviction that what was recently a daring innovation must be carefully handled, they have stressed the point that zoning ordinances should not be too drastic, and that relief from positive hardship in the exceptional case should be provided. This insistence has aided both in creating wide support among property owners and citizens generally, and in winning the approval of the courts.

ZONING SITUATION IN NEW YORK CITY

In view of this situation it has been particularly discouraging that in New York City, which pioneered in adopting the first comprehensive zoning ordinance in the country in 1916, the Board of Standards and Appeals has for several years been under suspicion, due chiefly to the circumstance that exceptions from the zoning regulations were granted with surprising frequency to owners who happened to be represented by a certain practitioner, while most other applicants and their lawyers were unlucky. This matter, along with various other irregularities in the city administration, came to a head in 1930, when it was revealed that the doctor's fees had reached an almost staggering total. Incidentally an indictment was brought against the chairman, who finally resigned. When his case was tried the evidence adduced was deemed inadequate, and a verdict of acquittal was directed. It is to be hoped that sufficient public attention has been directed to the work of the Board that it will function more satisfactorily.

CHICAGO

The case of the Cuneo Tower, in Chicago (see American Year Book, 1929, p. 123) was decided by the Illinois Supreme Court in July, 1930

(Michigan-Lake Building Corporation *vs.* Hamilton). This was an instance of a flagrant attempt, aided by the City Council, to raise an established height limit of 264 feet at the street line, to 440 feet, thus benefiting the owners of land upon which a 657-foot tower building was projected, whereas over 60 other buildings had been constructed under the original ordinance. The court held that this violated the zoning statute requiring the Council, in respect to a proposed zoning ordinance, to consider existing conditions, conservation of property values, the direction of building development to the city's best advantage, and the use to which property is then devoted. The change in height limit was held to impair unreasonably the value of the buildings constructed under the prior ordinance and also to constitute *ex post facto* confiscation of property rights without compensation.

MINIATURE GOLF

A new subject for concern in connection with zoning has developed in the miniature golf course. The location of these courses in residential districts has occasioned considerable opposition because of noise, glare and annoyance generally, especially at late hours. In Westchester County, New York, the Supreme Court held that miniature golf was not golf, and could not be permitted in a residential district under the designation of a golf course, nor of a playground or public recreation building (Breba Realty Co. *vs.* City of White Plains).

ZONING REPORTS

In April, 1930, the Division of Building and Housing, Bureau of Standards, U. S. Department of Commerce, issued a valuable and comprehensive report on "Zoning Legislation in the United States." The National Housing Association, New York City, has prepared a useful bibliography on "Recent Books and Reports on Housing, Zoning and Town Planning."

AIRPORTS

One of the problems of particular current interest in connection with zoning is that presented by airports. These are obviously not residential, neither are they industrial, although there may be related industries that could logically be placed adjacent to them. They are commercial in that they meet a commercial need and offer various services for fees, this being true whether they are privately or municipally owned; but they can hardly be located in business districts, or even adjoining them, excepting in special instances where a large undeveloped area, capable of being turned into an airport without prohibitive expense and without usurpation against some more logical use, exists in a central location. The natural site for an airport in a great many cases is territory that is primarily residential. Here, however, the question of nuisance arises, for airports may occasion annoyance, discomfort, and actual dangers to nearby residents. The past year produced an important legal case bearing on this question (although not involving a zoning ordinance), Swetland *vs.* Curtiss Airports Corporation, where an airport was close to a high-grade country estate near Cleveland, O., the owners of which complained about annoyance from noise and crowds, discomfort from dust, and danger from airplanes flying over their land at low altitudes, and sought an injunction for trespass and the maintenance of a nuisance. The U. S. District Court held that an airport is not a nuisance *per se*, although one could be so located or conducted as to be a nuisance; that the one in question was not so located, nor, except possibly in a few minor particulars, so conducted; and that the passage of airplanes at an altitude over 500 feet (a limit derived from regulations of the Aeronautics Branch of the U. S. Department of Commerce) above the plaintiff's land was not trespass.

Pending adjudication of these points by the Supreme Court, it is thus tentatively indicated that an airport is not necessarily improperly located in a residential or suburban neighborhood, if it is well equipped and so conducted as to prevent or minimize annoyances; and there also appears the interesting point, not directly a zoning matter, but closely related to the principle of zoning, that the private land holder does not own the space above his plot to an indefinite degree, but that such an ancient theory must give way to the practical requirements of society under modern conditions. This is akin to the fundamental spirit of zoning, that private ownership of real property should be subject to reasonable regulation in the interest of the community.

COGNATE SOCIETIES

American Civic Assn., Union Trust Bldg., Washington, D. C.

American Legislators' Assn., Equitable Bldg., Denver, Colo.

American Municipal Assn., Lawrence, Kan.

American Society for Municipal Improvements, 3817 Olive Street, St. Louis, Mo.

Governmental Research Assn., 261 Broadway, New York City.

International City Managers' Assn., 923 East 60th Street, Chicago, Ill.

National Assn. of Civic Secretaries, Ridge Bldg., Kansas City, Mo.

National Civil Service Reform League, 519 Fifth Ave., New York City.

National Institute of Public Administration, 261 Broadway, New York City.

National Municipal League, 261 Broadway, New York City.

DIVISION VI

TERRITORIES AND SPHERES OF INFLUENCE

ALASKA AND HAWAII

By William Atherton Du Puy

Executive Assistant to the Secretary of the Interior

ALASKA

Reindeer.—The most striking development is a growth to 1,000,000 in the number of reindeer and the development of a plan under which 300,000 of these animals a year may find their way into the meat markets of the world.

Employment.—During the first nine months of the year labor was well employed in nearly every section of the Territory, but during the early summer a surplus of laborers was reported in a few places, notably in southeastern Alaska. This is attributed to the influx of unemployed from the Pacific coast section of the United States, and it is believed that the fisheries and mines absorbed most of the unemployed before the middle of the summer.

Finances.—The balance in the Territorial treasury at the close of business June 30, 1930, was $968,947.99. The combined resources of the Territorial and national banks on the same date were: Capital, $915,000; surplus and net undivided profits, $935,300; deposits, $12,252,300; as compared with—capital, $915,000; surplus and net undivided profits, $815,100; deposits $12,754,500, for the previous year. The total assessed valuation of incorporated towns for 1930 was $25,512,663, as compared with $23,444,571 for 1929.

Exports and Imports.—The total value of the exports and imports for the fiscal year ending June 30, 1930, is $101,084,190, as compared with $107,831,665 for 1929. The exports were valued at $68,999,456 and the imports at $32,084,734, as compared with $76,038,452 and $31,793,213 for the previous year.

Mineral Production.—In the past 50 years, since 1880, the mines of Alaska have produced $615,501,000, according to the statistics compiled by the United States Geological Survey. Gold and copper are the chief minerals. The peak in mineral production was reached in 1916, when it was reported to be valued at $48,386,508. Since that time there has been a gradual decline until in 1928 it reached the low point of $14,061,000. In 1929 it was $16,066,000, or an increase of $2,005,000. This is accounted for by an increase in the value of output of gold, copper, and lead. The increase in the gold production is gratifying and early reports from several districts indicate that a greater increase may be expected next year.

Gold.—In 1928 the production of gold from lodes exceeded that of the placers, but in 1929 the placers again forged ahead. The total gold production from all sources is estimated to be $7,761,000 as compared to $6,845,000 in 1928, and of this amount $3,644,000, or approximately 47 per cent, was derived from the lode mines; the amount secured from the placers being $4,117,000.

Copper.—Mining of copper ores on a commercial basis was confined to two districts, Latouche Island in Price William Sound and Kennecott in the Copper River district. In 1929, 590,400 tons of copper ore produced approximately 40,510,000 pounds of copper, valued at $7,130,000 as compared with 41,421,000 pounds valued at $5,965,000 in 1928. Present conditions in the copper market indicate that the production of copper will not be increased; in fact, further reductions may be expected.

Fish.—The total value of the Alaska fishing products in 1929, exclusive of aquatic furs, was $50,795,819, a decrease of $3,749,769, from 1928, when the value was $54,545,588. These figures represent the value of the manufactured product. It is estimated that the value of the catch to the fishermen was approximately $16,582,000. The round weight of the salmon catch landed by the fishermen was approximately 442,601,784 pounds and the corresponding figures for herring were about 153,105,752.

Seal Furs.—The latest available census of the seal herds on Pribilof Islands shows the total number of seals of all ages and classes in the herds is estimated to be 971,527. The Government assumed control of the herds in 1910. At that time there were approximately 132,000 seals, and the remarkable growth in 19 years is convincing proof of what may be achieved by proper methods of control and wise utilization of the surplus. Forty thousand fur sealskins were taken from the Pribilof Islands during 1929. Statistics prepared by the Bureau of Fisheries disclose that since 1918 $4,477,919.26 has been deposited in the Treasury of the United States as net revenue derived from the sale of fur sealskins.

Railroads.—The annual report of the general manager of the Alaska Railroad discloses that the freight revenue from rail lines increased 1.3 per cent and passenger revenue declined 5 per cent. Rail revenue from all sources decreased 6 per cent. Freight and passenger revenue from river boats decreased 18.5 per cent. The revenue from all sources including non-operating income decreased 6.5 per cent. The total deficit, all expenses except charges to capital account, was $1,231,998.14 as compared with $950,711.75 in 1929.

Aviation.—The Territorial government has constructed 63 landing fields in strategic places in the interior of Alaska, and now it is possible to reach hitherto isolated towns and villages in a few hours. Furs, mail, express, and passengers are transported with safety and comfort by airplane during all seasons of the year. Last year 3,654 passengers were carried for a total of 684,361 passenger miles without the loss of a plane or passenger. Planes in the interior are equipped with ordinary landing gear during the summer and with skis in winter.

Education.—One of the most difficult problems in a sparsely populated country is to provide adequate school facilities for all of the children. The schools of Alaska are supported by funds derived from two sources. The Territorial government provides appropriations from the Territorial revenues and the Federal Government by direct appropriations meets the expenses of the native schools. The Office of Education, Department of the Interior, has supervision over the native schools and the Territorial schools are under the jurisdiction of the Territorial Commisioner of Education. There are many adult residents in the Territory who have not had an opportunity to acquire an education or are unfamiliar with the American Government. Citizenship night schools are maintained for their benefit. This is a part of the nationwide movement to combat illiteracy. The Federal Government supervises the education, medical relief, industrial training and, to a limited extent, relief of destitution among the natives in Alaska.

HAWAII

Population and Races.—The development of the importance of Hawaii is shown by the fact that the population on April 1, 1930, as shown by the Fourteenth Census of the United was 368,336. Compared with a population of 255,912 in 1920, this shows an increase during the 10 years of 112,424 or 44 per cent. When the United States assumed control of Hawaii and in 1900 made a Territory of it the population was 154,000.

There continues that amalgamation of races that is doubtless the most novel in all the world—an amalgamation which is indicated by the numbers of children in the schools of the principal racial groups shown in the latest available figures as follows: Hawaiian and part Hawaiian 11,000, Portuguese 6,901, Porto Rican

1,163, Caucasians 3,251, Chinese 6,706, Japanese 39,115, Koreans 1,719, Filipinos 3,344, and all others 791, making a total of 73,180. All these peoples enter American public schools and emerge much alike save for racial physical appearance.

Sugar.—The production of cane sugar continues to be the main industry of the Territory. For the sugar year ended Sept. 30, 1929, Hawaiian plantations produced 913,670 short tons of raw sugar. Hawaiian plantations, due to the conservative financial policy under which they are managed, have so far continued their operations without affecting the basis of pay of employees, which fact has been to the material benefit of the Territory as a whole. On Dec. 31, 1929, there were 99,693 persons living on the sugar plantations in plantation houses, and in addition to this number there were several thousand persons engaged in sugar cane cultivation as homesteaders, independent planters, etc. Labor conditions on sugar plantations have been particularly good during 1929. There is much evidence of continuous improvement in the facilities devoted to the comfort, health, and welfare of employees. Relations between employees and employers have been continuously amicable and no labor disturbances or disputes have arisen.

Pineapples.—The pineapple pack for the calendar year ended Dec. 31, 1929, amounted to 9,211,376 cases, the largest in the history of the industry. The value, however, due to lower prices, was a decrease over the previous year, and amounted to approximately $39,880,136. The demand has been unusually strong and canners have found it difficult to fill all orders. This has been especially true of crushed pineapple, which but a few years ago was very difficult to market.

Coffee.—The acreage of bearing coffee fields is about 4,740 acres, consisting of 1,089 units of farms and 2,212,000 coffee plants. The acreage of non-bearing fields is 526 acres, divided into 200 farms. There are about 237,000 trees on these farms. The total acreage is 5,266 acres of 2,449,000 coffee trees, divided into 1,289 farms. The largest single farm is only 34 acres. The size of the majority of the farms is 5, 6, or 7 acres. Only 98 out of 1,089 farms are 10 or more acres in size, which is less than 10 per cent of the total.

Education.—The enrollment in 181 schools has increased from 70,000 in 1929 to over 73,000 in 1930, while the teaching staff has grown from 2,485 to 2,563 during the same period.

Every effort is being made, both through the activity program and vocational training, to interest the young people in local industries. To carry out this program effectively requires also the coöperation of the industries themselves, and notable progress has been made along this line by a number of agencies. Progress has been made during the past year toward housing all public-school pupils in government buildings. For the first time in a decade none of the Honolulu schools are using Japanese-language school classrooms. This result is due partly to an active building program extending over a period of six years and partly to a slight decline in the annual rate of increase in enrollment. An analysis of population trends indicates that the housing problem of the future will be somewhat less acute.

Health.—Child health is one of the most important educational responsibilities. Impetus for improvement in this field was given by a number of important developments during the past year. A joint health committee was formed during the past year from representatives of the department of public instruction, the board of health, Panama settlement, the medical association, and other health organizations. Much constructive work has been accomplished by this committee by way of physical examinations and improved health service to school children.

Elections.—Territorial general elections are held in November of each even year to elect a delegate for two years, one-half of the members of the senate for four years, and all members of the house of representatives for two years. For the island of Oahu are elected a mayor of the city and county of Honolulu, the supervisors, an attorney, clerk, treasurer, auditor, and the sheriff. The outside counties of Hawaii, Maui, and Kauai elect to the same offices, with the exception of mayor. In the city and county of Honolulu and in the counties of Maui and Kauai supervisors are elected at large. Since 1913 the county of Hawaii has employed a system of electing three supervisors from each of the two representative districts, and one, the chairman of the board, from the county at large. In 1913 a direct primary law was enacted. Provision was made whereby the counties of Hawaii, Kauai, and Maui should hold elections separately from Territorial elections. This system was changed by Act of 56 of the legislature in its session of 1929, and beginning with the year 1930, all county elections will be held simultaneously with Territorial general elections on the first Tuesday after the first Monday in November. A racial classification of voters on the basis of the 1928 census showed: Hawaiian voters, 18,952; Portuguese voters, 7,057; Chinese voters, 3,950; Japanese voters, 4,839; Caucasian voters and other voters, 11,260.

PORTO RICO

BY FRANCIS LEJAU PARKER

BRIGADIER GENERAL, U.S.A.; CHIEF, BUREAU OF INSULAR AFFAIRS, WAR DEPARTMENT

Government.—Horace M. Towner, Governor of Porto Rico, resigned effective Sept. 29, 1929, and was succeeded by Theodore Roosevelt, who assumed his duties Oct. 7.

HURRICANE RELIEF

Measures for Rehabilitation.—The consequences of the hurricane of Sept. 13, 1928—its effect on the people, on the Insular Government revenues, and on all activities of the Island's economic and social life—through the fiscal year ended June 30, 1929, were fully discussed (AMERICAN YEAR BOOK for 1929, page 131). In his inaugural address, delivered approximately a year after the great hurricane which swept Porto Rico in September, 1929, Governor Roosevelt emphasized economic rehabilitation as the consideration of first importance since upon its accomplishment depends largely the ability to achieve satisfactory progress in public education, public health and the material prosperity necessary in order that the people may have proper food, clothing and living conditions. As specific and immediate features of this program he indicated the promotion of relief measures for the sufferers from the hurricane; the development and extension of markets for Porto Rican products; the improvement of methods of agriculture; industrial development; aid to those Porto Ricans who might seek opportunities in the various field of activity offered by the continental United States; and the encouragement of tourist travel to the Island. In subsequent messages to the Legislature, he stressed the need for administrative economy and for a general constructive program of rehabilitation.

Appropriations and Loans.—The Porto Rican Hurricane Relief Commission has accomplished much in this direction. All but $1,000,000 of the $8,150,000 appropriated by Congress last year for relief work has been made available. This $1,000,000 will be available on Jan. 1, 1931. In addition, Congress this year provided another $1,000,000 for the repair and asphalting of the Insular roads; $2,000,000 more has been authorized for this purpose, but not yet appropriated. Up to June 30, 1930, the Commission had approved loans, from Federal funds, to individual agriculturists, amounting to $5,891,228 out of a total of $6,000,000 available for that purpose. An additional $71,000 was applied to the distribution of seeds and seedlings. Of this amount,

$22,700 was expended during the year. The Commission had also expended $585,000 for the repair of Insular and municipal roads, which gave employment for two weeks or more to approximately 30,000 men. The amount the Commission expends for the construction and repair of schoolhouses will, when the work, begun in 1929, is completed, total about $1,400,000.

ECONOMIC CONDITIONS

External Trade.—The following table shows a return to a trade balance favorable to the Island:

	1900	1929	1930
Brought from the U. S.	$ 6,952,114	$ 85,078,596	$ 73,078,779
Shipped to the U. S.	3,350,577	76,418,210	95,087,640
Brought from foreign countries	3,037,391	12,782,164	10,843,050
Shipped to foreign countries	3,261,922	5,304,660	4,559,018
Totals	$16,602,004	$179,583,630	$183,568,487

The total imports show a decrease of nearly $14,000,000 since 1929 and are less than in any year since 1923. On the other hand, exports show an increase of nearly $18,000,000. The bulk of this increase was due to sugar shipments, which rose in value from $35,200,000 in 1929 to $53,670,000 in 1930, almost as high as the figure reached during 1927 and 1928. The price per pound was a fraction lower, but there was a notable increase in production, total exports reaching 643,944 long tons. Fruit shipments more than doubled those of 1929 and exceeded the value for any previous year. Coffee exports decreased 66 per cent and the value is the smallest ever recorded. Decreases are shown in tobacco and coconut shipments.

Labor Problems.—The Governor reports: "More than 60 per cent of our people are out of employment either all or a part of each year. The average yearly income of the working man or woman ranges between $150 and $200. Hundreds come to the government offices weekly, with but a single request—work. . . ." This condition is brought about by a number of different factors. The basic problem is over-population. According to the Fifteenth Census, taken as of April 1, 1930, the population of Porto Rico is 1,543,913, which represents an increase of 244,104, or 18.8 per cent since 1920. The average number of inhabitants to the square mile is 449.5. To support this population, the Governor emphasizes the necessity of intensive agriculture and the development of industries.

Farms.—The Governor calls attention to the ownership of large farms by corporations or individuals and outlines a program designed to get more lands suitable for farming into the ownership of the people. To assist small farmers, the last Legislature authorized a bond issue of $500,000 to extend the scope of the Homestead Commission and make possible the purchase of cheap land from large landholders for homesteading purposes. In the past, the important agricultural crops have been sugar, coffee, tobacco and fruit. Special emphasis is being given now to the increased production of vegetables. The Governor thinks a great diversity of crops is possible in Porto Rico, which, due to water transport, can be shipped to the north either fresh, canned or dried. Farmers have been organized so as to sell their products in the north, and other steps are planned to instruct the farmers how to cultivate proper and profitable crops and how to market them.

Industries.—The Governor says: "Even if we practice intensive agriculture fully and develop our small farms, we cannot by agriculture alone support our population. We must in addition have industries. . . . There is an exceptional opportunity for the development of industries in Porto Rico. There is an abundance of intelligent, honest and industrious labor. We have power, both hydro-electric and manufactured, and a water-haul to any of the world markets." In order to draw the attention of the business people in continental United States to the opportunities offered by Porto Rico, the Legislature this year created a Bureau of Commerce and Industry. Its activities embrace varied endeavors from embroidery and clothes manufacturing to the canning of fruit, hat-making, sugar refining, hosiery, etc. Private capital on the Island is being organized to undertake the fishing industry.

GOVERNMENT FINANCES

Revenues.—Due to the hurricane and consequent economic depression, revenues during the fiscal year ended June 30, 1929, had shrunk, as was reported in the AMERICAN YEAR BOOK for 1929. The condition of the treasury was further affected by the protracted slump in the sugar market. Prompt measures were taken by the government. Non-essential expenses were eliminated from government operations and the annual budget thus reduced, an intensive campaign was made for the collection of past-due taxes, new loans were contracted amounting to $1,359,000, and a $4,000,000 bond issue was authorized by the Legislature. As a result, the Island debt was funded, banks were freed of loans they were carrying, and provision was made to meet the operating deficit for the year. On June 30, 1930, revenue receipts showed a reduction from $11,004,138 in 1929 to $9,614,246. Marked reductions were shown in all classes of tax collections and the number of delinquent taxpayers is very large.

Bonded Debt.—During the year, $750,000 additional bonds of the Insular government were issued, and $682,000 were redeemed, leaving the total bonded debt of the Insular government on June 30, 1930, at $25,353,000, as compared with $25,285,000 on June 30, 1929. The bonded indebtedness of the 77 municipalities is $17,846,200, a decrease of $540,100 during the year. There is an additional total of unfunded municipal debts, amounting to nearly $2,500,000.

PUBLIC WORKS

Buildings.—Due to the condition of the treasury, building activities were largely confined to the completion of buildings already under way. The new insane asylum at Rio Piedras was completed and work on the penitentiary continued. It was not possible to continue work on the capitol building. Among the few new buildings begun were the School of Arts and Trades at Rio Piedras and the new high school at Fajardo. Extensive repairs were made to various buildings, including the Fortaleza. Most of the school buildings damaged by the hurricane have been repaired or rebuilt.

Roads and Bridges.—Road construction activity fell considerably below that of any other year since 1918. The work carried on consisted in the completion of 13.50 km. of new macadamized road and the construction of 3 new bridges and 2 viaducts with an aggregated length of 293.50 lineal meters.

EDUCATION

The total enrollment in the public schools was 221,248; in private schools, 5,728. The average daily attendance was 193,396; the number of teachers, 4,451. The schools were conducted in 2,250 school buildings representing 4,690 class rooms. Realizing the necessity of revising courses along lines of practical activity, increasing attention is being given to industrial and vocational subjects, particularly the teaching of agriculture. About 600 acres were devoted to school gardening, used chiefly for the raising of vegetables, and there were over 15,000 home gardens. Other subjects included trades, such as barbering, carpentry and cobbling for boys and home economics for girls. The total expenditures for educational purposes for the year were $4,090.038 by the Insular Government and $1,296,885 by the municipalities. With a population of school age of over 500,000 and only about 44 per cent enrolled, it is evident that the school facilities are still inadequate.

HEALTH CONDITIONS

Plans and Funds.—Health conditions in Porto Rico, though markedly improved over those of thirty years ago, still present a serious problem, complicated by a population density over ten times that of the continental United States and by the very limited income and material resources of the average inhabitant. The matter of adequate funds to finance more extensive health activities constitutes, as in the case of education, one of the difficulties to be met. For the immediate future Governor Roosevelt hopes to have substantial assistance in this connection from the continental United States. Certain national organizations of standing have formed a joint committee, which, under the name of the Porto Rico Child-Health Committee, plans a five-year program directed against disease in Porto Rico and one of its important allies, malnutrition. The Committee has announced its intention of endeavoring to raise $7,300,000 with a view to giving effect to the program. Meantime, during the past year contributions from the National Headquarters of the American Red Cross totaled over $80,000 and those from other associations in the United States totaled about $150,000.

Mortality.—The annual mortality rate for 1929-30, 21.3 per 1,000 of population, marked a rapid reduction of the abnormal rate (27.7) of the hurricane year 1928-29. The average rate for the five-year period immediately preceding the hurricane year was 21.9. The infant mortality rate for 1929-30 was 133 per 1,000—an excellent showing, being the lowest rate, but one, shown by the records of the preceding six-year period and a very great reduction from the hurricane year rate of 179.

DISTRICT OF COLUMBIA

By W. Reed West

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LEGISLATION

Federal Contribution to Expenses.—The District Appropriation Act (71st Cong., Sess. II, Chap. 848) appropriated as the share of the Federal Government in District expenses the sum of $9,500,000, an increase of over $500,000 over the previous year.

Courts.—The Second Deficiency Act (Chap. 846) created two additional judges for the Court of Appeals and two additional judges for the Supreme Court of the District, and at the same time a commission was authorized to be appointed by the justices of the Supreme Court of the District to study court procedure in other jurisdictions in maintaining trial dockets, calling cases for trial and other matters relating to the dispatch of court business.

Free Textbooks.—An Act (Chap. 32) provided for free textbooks and supplies in the junior and senior high schools. The elementary schools have been cared for in this respect since 1891.

Building Regulations.—To protect the beauty of the public buildings and the more important park systems in the District, an act (Chap. 29) provided for the approval of the Commission of Fine Arts upon new buildings or alterations upon old buildings fronting or abutting upon certain public grounds and parks.

Claims and Suits.—An act (Chap. 400) extended the power of the Commissioners to settle claims and suits against the District so as to cover the acts of officers and employees where the performance of a governmental function could be used as a defense against claims for damages.

Minor legislation permitted fraternal and benevolent corporations to separate their insurance activities from their fraternal activities and operate as distinct corporations (Chap. 135); increased the appropriation authorized for the construction of a children's tuberculosis sanitorium and authorized the condemnation of land for a site outside the

District by the Attorney General of the United States (Chap. 186); authorized the District to use its incinerators for the destruction of the refuse of neighboring counties (Chap. 286), and increased the pay of members of the fire department and police force (Chap. 783).

CIVIL SERVICE

An executive order of the President of the United States, Nov. 18, 1930, authorized the United States Civil Service Commission to apply the principles of the Civil Service Act and Rules, by certifying the names of eligibles to the Commissioners. While this order does not make it mandatory that vacancies be filled in this way, it does permit the application of the system to various classes of employees as they may be designated by the Commissioners. It is expected that from time to time classes will be placed in this way under the rules of the Civil Service Act, as the order seems to have been desired by the Commissioners. The Metropolitan Police and the Fire Department are already under the Civil Service Act and Rules by statute.

THE PHILIPPINE ISLANDS

By Francis LeJau Parker

Brigadier General, U.S.A.; Chief, Bureau of Insular Affairs, War Department

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GOVERNMENT

General Conditions.—Dwight F. Davis, who as Secretary of War had exercised departmental supervision over the Philippine Islands and had gained a broad knowledge of their affairs, was appointed Governor General June 4, 1929, to succeed Governor General Henry L. Stimson, and arrived in Manila July 8. On the general conditions throughout 1929, he states, in his report dated May 1, 1930: "For the people in general, as well as the Government, the year was on the whole a very satisfactory one. Peace and order were excellent, and with the exception of two typhoons which swept through some of the southern islands, the country was free of major disasters. Health conditions were very favorable. While prices of staple crops were low, their volume was larger than ever before. This prosperous condition of the country was reflected all along the line in increased revenues of the Government. A typical example of this is the fact that internal revenue collections increased over $1,250,000, or about four and one-half per cent. There was unmistakable evidence, however, toward the end of the year that continued low prices were slowing up the business situation and competent observers expect that the revenues of the Government will be diminished for the year 1930, and business in general will be somewhat poorer during the first part of the year."

Policies and Acts.—In his inaugural address, Governor General Davis made it clear that his administration proposed to emphasize economic development and the elmination of dishonest and incompetent officials. A week later, the same policy was reiterated in his message to the Legislature and has been consistently followed. He has expressed opposition to the campaign in the United States against certain Philippine exports, notably, sugar, and has pointed out the desirability of decreasing the cultivation of sugar, of which there is a world oversupply, and centering energetically upon a greater diversification of crops. He considers that economic development is the most important problem of the Philippines, underlying all others.

Legislation.—The legislative session was characterized throughout by harmony between the leaders and members of the Legislature, on the one hand, and the executive departments on the other. For the first time in many years, the appropriation bill was approved without change. Altogether 187 bills were passed by both houses of the Legislature. The largest number passed in any of the preceding seven sessions was 122. One of the outstanding achievements of the session was the enactment of a law prescribing the form for measures granting electric light and power franchises. Other important measures enacted included provision for the appointment of a committee to study ways to promote the economic development of Mindanao and Sulu and other specially organized provinces, a new marriage law, a measure to promote tourist travel in and to the Islands, one making comprehensive changes in the banking provisions of the corporation law tending to encourage agricultural loans and permitting the banks to give increased credit to farmers, and one providing for the construction of a group of insular government buildings in Manila.

Administrative Investigations.—Rumors of serious irregularities in certain bureaus of the Department of Commerce and Communications resulted in the conduct, under the head of that Department, of a number of administrative investigations as to actual conditions. Instances of serious dishonesty and incompetency, extending to some of the ranking officials of the bureaus concerned, were developed and resulted in a number of resignations, dismissals, and other corrective measures. Prosecutions of certain officials were being conducted at the close of the period to which the Governor General's annual report pertains.

FINANCIAL AND ECONOMIC CONDITIONS

Finances.—The government is in a very sound position financially. The larger agricultural production of the Islands gave more revenues to the country. The year registered the second largest income tax collections since the Income Tax Law was enforced in the Philippine Islands. Expenses decreased, and at the end of the year there was a surplus of over $25,000,000, of which there was an unappropriated cash surplus of over $5,000,000. The net bonded indebtedness of the Government (insular, provincial, municipal and city governments) Dec. 31, 1929 amounted to $88,818,500, for which there were accumulated sinking funds amounting to over $24,000,000. The four government-owned business enterprises (see AMERICAN YEAR BOOK for 1929, page 140) made encouraging profits during the year. The Philippine National Bank made a net profit of $1,632,513. The five sugar centrals financed by the bank, besides paying interest, reduced their principal indebtedness by $1,744,210. Since 1926 this indebtedness has been reduced from $24,000,000 to $14,000,000. The total currency circulation was $61,769,035.

Agriculture.—In spite of the decline of business activity in the middle of 1929, the economic and business conditions in general were better than those prevailing in 1928. One of the greatest problems confronting the government is some means of speeding up the disposition of public lands, and careful study is being given to this matter. An interesting experiment is being tried out by setting aside a large area as an agricultural colony in Bukidnon for pineapple cultivation and permitting a corporation to take up a smaller area within the reservation and finance homesteaders who will settle the colony and raise pineapples.

Miscellaneous.—The production of gold is becoming an appreciable factor in the Islands' business. Marked progress was made in the administration and management of the public forests. Lumber trade was very active; 18 new sawmills began operations during the year.

Foreign Trade.—The total trade of the Islands was the largest ever recorded. It reached the amount of $311,600,000—$164,500,000 representing exports and $147,100,000 imports. The products exported, in the order of their importance as to value, were sugar, coconut oil, abaca, copra, tobacco products, embroideries, copra meal or cake, lumber, desiccated coconut, and hats. Sugar constituted

32 per cent of the total exportations, about 98 per cent of which came to the United States. Coconut oil exportations represented 18 per cent of the total, 99 per cent coming to the United States. Embroideries, almost all of which came to the United States, increased 33 per cent, copra meal or cake, 31 per cent, lumber, 15 per cent, tobacco, 3 per cent. In the order of their importance as to value, the principal imports were cotton and its manufactures, iron and steel and their manufactures, mineral oils, automobiles, meat and dairy products, rice, wheat flour, silk and its manufactures, paper and its manufactures, and electrical machinery and appliances. The significant features of the imports were the great increase in the importation of rice and the large purchases of luxuries. The consumption of steel, most of which has always come from the United States, has increased more than 67 per cent since 1924. The United States is the Island's best market. Trade with the United States amounted to $217,058,000, or about 70 per cent of the total. Imports from the United States amounted to 62 per cent of the total, or $92,500,000, including cotton goods, iron, steel, foodstuffs and paper; exports represented 75 per cent, or $124,000,000, including sugar, hemp, copra, coconut oil, tobacco and miscellaneous products. Next to the United States, the largest volume of Philippine trade was carried on with Japan, representing 6.12 per cent of the total, followed by Great Britain, 4.09 per cent, China, 3.30 per cent, Germany, 2.70 per cent, and Spain, 2.20 per cent. American vessels continue to lead in the Islands' foreign carrying trade, British ships ranking second

EDUCATION

Enrollment.—There were 1,161,367 pupils enrolled in the public schools, an increase of approximately 50,000, made possible by an appropriation of $350,000 for school extension which permitted the organization of over 1,000 classes. While the enrollment in the public schools gradually increases, the school population increases at practically the same rate and the schools are able to provide accommodations for but little over one-third of the children of school age.

Appropriations and Expenditures.—Expenditures for public schools are increasing from year to year. Continuance of popular interest in education was shown by the granting of liberal appropriations for general operations and for the construction of school buildings. Educational research was given added impetus during the year by a gift of $160,000 from the International Board of Education.

Vocational Training.—Achievements in vocational education have assumed a noteworthy proportion. A thorough survey of the situation was made this year by Dr. C. A. Prosser, of the Dunwoodie Institution, one of the leading industrial schools in the United States. Facilities for vocational training have been on the increase but they are still far from sufficient.

Health Education.—Health instruction has been a leading activity. To further the promotion of health education, a conference of supervisory and administrative officials of the Bureau of Education, in conjunction with representatives from certain other Bureaus, was held in Baguio in May. A survey of this field of education was made during the year by Miss Sally Lucas Jean, a specialist in health education.

HEALTH CONDITIONS

Mortality.—In general, health conditions were satisfactory. The number of deaths from dysentery and beri-beri increased. A fall in mortality was noted in typhoid fever, malaria and measles, but the rise in other diseases made a slight increase in the general death rate, which was estimated at 22.18 per thousand, two points higher than in 1928. Infant mortality increased. Tuberculosis continues to stand first as a cause of death. Over 30,000 deaths during the year were attributed to this disease. Only one case of cholera appeared in the Islands during the year. This makes a three-year period during which there has been no outbreak of this disease. There were no cases of smallpox, with the exception of an outbreak in the islands of Saragani and Balut, Province of Davao. These cases occurred in the Moro population.

Hospitals.—Three new hospitals totalling 225 beds, one laboratory, and three public health dispensaries were opened during the year.

Leprosy.—The outstanding problem of leprosy was given special attention, and marked progress in its control has been observed. The activities inaugurated in Cebu in 1928 were extended to the Bicol Region and Iloilo. A treatment station is under construction at Zamboanga, and skin disease clinics were established in the Ilocos Region. At the end of the year, 6,494 lepers were under segregation, 5,477 of them confined to the Culion Leper Colony; 553 lepers were rendered negative and released under parole. One-third of the Insular appropriation of the Health Service is utilized in segregation and treatment of lepers. Aid from the Leonard Wood Memorial for the eradication of leprosy has continued. In addition to expending $180,000 for the Cebu Leprosarium, that organization released $142,500 for use in Culion and $15,000 for the erection of a skin clinic at Cebu.

Meningitis.—Early in the year reports were received of a considerable number of cases of cerebrospinal meningitis among Flipino steerage passengers on vessels which had left the Philippines en route to the United States. Meningitis is not a common disease in the Islands and there appeared to be little doubt that the cases mentioned were picked up in Oriental ports by Filipinos en route to the United States who, on account of the unaccustomed cold and frequently their insufficient clothing, were peculiarly susceptible.

VIRGIN ISLANDS, GUAM AND AMERICAN SAMOA

By W. R. Furlong

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VIRGIN ISLANDS

Government.—Capt. Waldo Evans, U. S. Navy, retired, has been governor since March 1, 1927.

Revenues.—The Virgin Islands are not self-supporting, and in order to maintain the standards which have been set since the transfer of the islands to the United States, it is necessary for the local colonial councils to enact budgets considerably in excess of the local revenues, the deficits being made up from the Congressional appropriation. For the fiscal year 1930 following the hurricane a Federal appropriation of $314,000 was made; and for the fiscal year 1931 the usual amount has been increased to $421,000, $141,000 of which were for special projects to improve economic conditions. In the summer of 1930 the West Indian Sugar Company, the largest sugar company of the Virgin Islands, failed and closed down. This being the largest economic unit on the Island of St. Croix, its failure has reduced the island government revenues by about $50,000 directly and indirectly.

Industry.—The sugar industry of St. Croix has reached a crisis due to the difficulty of competition with the great sugar-producing countries of the world, the growing importance of the beet sugar industry, the low price of sugar, and frequent prolonged droughts. Due to these causes, the close of the fiscal year found both of the sugar factories in the island in financial difficulties, which have resulted in practically an entire cessation of work on their estates. During the fiscal year 1930 approximately 5,750 tons of sugar were manufactured; and 5,321 tons were exported, valued at $392,200, about 400 tons of which were carried over from the previous year's crop. There were manufactured during the fiscal year 1929, 3,875 tons of which 1,000 tons came from the crop of the previous year. During the fiscal year 1929, 8,004 tons of sugar were exported, valued at $669,398. The sugar crop in St. Croix over a number of years has been about 7,000 tons. In the harvesting seasons following good rainfall as much as 12,000 tons of sugar are produced.

Cattle Industry.—Next in importance to the cultivation of sugar cane in the island of St. Croix is the raising of cattle. This industry has been aided within the past ten years by the opening of the Porto Rican market and the drilling of wells. Due to the fact that Porto Rico now has other sources of supply, the price of cattle has declined considerably and stock raising is not so profitable as it was a year or two ago. The Department of Agriculture, in continuing its experiments with a view to improving the strain of local animals, made a shipment of thoroughbred animals to the Virgin Islands during the year. It is believed that the livestock industry will benefit greatly by the activities of the Agriculture Department. During the fiscal year 1930 there were 1,326 head of cattle exported from the Virgin Islands to Porto Rico, valued at $86,057.

Bay Rum.—The production of St. Thomas bay rum continued to increase. The fiscal year 1930 was the record year for production and sale. During the fiscal year 1930 there were 108,182 gallons of bay rum produced. This compares with 91,116 gallons for 1929.

Transportation and Communication.—St. Thomas on the Island of St. Thomas is the chief port of the Virgin Island. In 1930 pilotage of $13,480 was collected with shipping tonnage at 2,403,420 tons. The Pan-American Airways, Inc., extended its mail and passenger service to the Virgin Islands during the year. This airmail schedule affords excellent mail facilities to the southern islands and to continental United States. The New York, Rio & Buenos Aires Line, Inc., also extended its passenger service to the Virgin Islands during the year. Steamship communication between the Virgin Islands and continental United States has been augmented by the inauguration of the Western Ocean Steamship Corporation. The All America Cables, Inc., opened an office in St. Thomas during the year. Heretofore all cable service in the Virgin Islands was furnished by the West India and Panama Telegraph Company, Limited.

Climate.—A prolonged drought during the spring of 1930 handicapped the agriculturists and the cattle raisers. The depleted water supply, at times perilously low, was a source of grave concern. While the reserve municipal supplies sufficed to obviate greater distress, the unusually severe drought accentuated the need of additional water supply for agricultural as well as for domestic uses. The growing sugar cane in St. Croix has been damaged so seriously that it is impossible to estimate the size of the 1931 crop.

Health.—The birth rate per thousand over a period of five years, 1925-1929, was 21.9; the death rate for this period was 21.5. During the past year 952 patients were admitted to the municipal hospital in St. Thomas, 844 in Christiansted, and 904 in Frederiksted. June 30, 1930, there were 79 patients in the leper asylum in St. Croix, and 42 patients in the insane asylum in St. Croix.

Population.—The results of the census of 1930 as compared with the census of 1917, the last official census of the Virgin Islands, give St. Croix a population of 11,413, St. Thomas, 9,834, and St. John, 765.

Education.—During the fiscal year 1930 a total of $102,373.47 was made available for educational purposes in the Virgin Islands, or an average cost of $33.44 per pupil. This compares with $95,269.67 for education in 1929. The school enrollment was 3,061 as compared with 2,950 during the previous fiscal year. In addition, there were 1,077 enrolled in private schools. During the year 113 teachers were employed in the public schools. The enrollment of teachers in the 1929 summer school was 76.

AMERICAN SAMOA

Government.—Capt. Gatewood S. Lincoln, U. S. Navy, has been governor since August 2, 1929. A joint resolution by the Congress of the United States, approved February 20, 1929, formally accepted the cession of these islands, and a congressional commission was appointed by the President to make such recommendation to Congress concerning legislation for the islands as they deem proper. This commission consists of two senators, two members of the House of Representatives, and three Samoan chiefs. They met in Samoa in September, 1930. The Secretary of Native Affairs and American Judge of the High Court of American Samoa is an American civilian. The present judge is Harry P. Wood.

American Samoan Commission.—During September and October, 1930, a commission appointed by the President visited American Samoa with a view to recommending legislation to Congress on the subject of government. The commission comprised Senator Hiram Bingham, Chairman, Senator Joseph T. Robinson, Representative Carroll L. Beedy, Representative Guinn Williams, High Chief Mauga, High Chief Tufele, and Chief Magalei. As a result of the hearings held and studies made in American Samoa the commission will recommend the following legislation to Congress for the Samoan people: (a) American citizenship; (b) An organic act containing a bill of rights; (c) Give the Fono (legislative body of chiefs) authority to pass laws over the governor's veto by 2/3 vote, with final reference to the President. The Fono was formerly advisory only with the Governor having final action; (d) Right of appeal in certain cases to District Court of Hawaii and thus to the U. S. Courts; (e) That land may be acquired by inheritance or purchase but only by citizens of Samoa. The Fono shall decide who are citizens but must include persons with any Polynesian blood if otherwise qualified. This will be a beginning in changing the land laws; the lands with very few exceptions are now held under communal ownership and worked communistical under the direction of the chiefs; (f) The governor shall be appointed by the President and confirmed by the Senate. He may be a civilian, naval officer, or army officer.

Revenues.—The total customs department revenue from all sources for the year 1927-1928 was $72,833.43; for the year 1928-1929, $73,923.30; and for 1929-1930, $64,324.57. The value of merchandise on which duty has been collected, excepting parcel post, during the fiscal year 1928 was $167,064.00; 1929, $172,465.00; and 1930, $146,534.00.

Taxes.—There were, for the fiscal year 1930, 2,299 taxpayers in American Samoa. The subject of taxes and that of copra go hand in hand as practically all the money with which natives' taxes are paid is derived from the sale of copra. At the last meeting of the legislative body known as the Fono (1929) this body raised the taxes for each native taxpayer from $9.00 to $11.50. This covers $7.50 poll tax and $4.00 school tax.

Copra.—Production for the year 1929 was 1,687 tons and the amount shipped 1,591 tons, the difference being the shrinkage The contract price for 1929 was $92.51 per long ton and the total gross receipts for the crop was $147,215.90. For the year 1930 the copra is to be sold at $83.40 per ton.

Banking.—The increased rate of interest on savings accounts to 4 per cent per annum and the efforts of the administration have resulted in a steady growth of the savings accounts for the past three years Net earnings of the bank in 1930 amounted to $1,106.69.

Population.—The 1930 census shows a population of 9,866, including Swains Island, but exclusive of naval personnel. There are very few people of any race other than the natives in the island except the officials of the government and naval station.

Education.—There are twenty schools in the public school system of American Samoa, with an enrollment of 2,044, the largest in the history of these schools. Poyer School is the largest and best school on the island; and it is upon the graduates of this school that the island depends for most of its teachers. The present teaching staff (1930) consists of forty-six, of whom forty-one are

Samoans and five white. The sum of $19,561.58 was expended in the Department of Education during 1930. The cost per pupil was less than $8.00 on account of the small cost of buildings, no heating of buildings, and the low salaries paid teachers. There are four private schools with an enrollment of approximately 350.

Highways.—The highways already established in American Samoa have been kept in a fair state of repair throughout the year. The total amount expended by the Public Works Department in all its projects during the fiscal year 1930 was $22,195.65.

Health.—Filariasis is the only insect-borne disease that is endemic in American Samoa. During the last three years extensive experimental work has been done under the direction of the Public Health Officer in connection with the treatment of filariasis and elephantiasis. During the last fiscal year an epidemic of dengue fever prevailed for some months in the islands, brought in by a ship that visited Suva where the epidemic was prevailing at that time. There were no fatalities from this fever. There are only two cases of leprosy in American Samoa, and the origin in each case has been traced to a source in Western Samoa.

GUAM

Government.—Commander W. W. Bradley, U. S. Navy, has been governor since June 11, 1929 Officers for administering the government are quite similar to those in a county in the United States. There is also a congress which assembles periodically. The seat of the island government is Agana.

Population.—The native population of Guam by the 1930 census was 17,592. In 1901 the population was 9,785. The present inhabitants have a Spanish-Mexican-Philippine strain, with Malay predominating.

Health.—For the fiscal year 1931 the Federal Government appropriated $22,000 for the care of sick and the maintenance of lepers. There are no civilian physicians or hospitals in Guam, nor could the population maintain them; and the natives, with few exceptions, are dependent for prevention of disease and for medical care upon the Federal Government.

Education.—For the fiscal year 1931 the Federal appropriation for education was $13,000. This is in addition to about $50,000 which is appropriated from revenues raised by the local island government. The enrollment for the year 1930 averaged 3,683, 2,020 boys and 1,663 girls. The percentage of attendance for the year was 96.67. There are five American teachers and 120 native teachers and two carpenter teachers in the native schools There are 2 American teachers in the two American schools. The enrollment has increased from 2,787 in 1926 to 3,760 in 1930.

Agriculture.—The copra exports from Guam during 1930 amounted to 2,376 tons. Coconut oil exports were 19 tons. The value of copra exports was $187,471. The agricultural progress of the island improved considerably during the year. Interest is being shown in the raising of rice, pineapples, corn, and the other food crops already grown with success in the islands—yams, sweet potatoes, taro, bananas, and plantains. It is hoped that something will come of an infant pineapple industry recently started.

Banking.—There is one bank in Guam. It is authorized to conduct business of commercial banking as a division of the Treasury of the local government. During the fiscal year 1930, the bank financed shipments of merchandise imported by Guam merchants to the value of $477,966.79. Gross earnings for the fiscal year were $34,348.71; net earnings for the same period were $13,302.54. Interest and dividends at the rate of 7 per cent was paid to class "B" depositors. This is the maximum allowed according to the written policy of the bank. June 30, 1930, the depositors of record totaled 1,347.

Shipping.—Ocean transportation continues to be one of the most difficult and serious problems for Guam; in fact, the situation has become worse during the past year owing to the reduction by practically one-half in the number of Navy transports calling at Guam. The prospect of obtaining relief from this difficult situation appears to be much better than at any time in recent years by the establishment, by the Dollar Steamship Company, of a direct service between San Francisco and Singapore.

Revenues.—Revenues and expenditures for the fiscal year 1930 totalled $148,903.21 and $165,442.85 respectively. The total of investment revenues in 1930 was $29,374.76.

SPHERES OF AMERICAN INFLUENCE

By Roy Malcom

Professor, University of Southern California

HAITI

Political Unrest.—Dispatches from Haiti early in December, 1929, indicated that there was widespread discontent and unrest. Trouble had been brewing for several months, particularly in labor circles. Political agitators opposed to President Borno, were important factors in the situation. Word went out from Washington on Dec. 6 that American marines were being rushed to Haiti and that President Hoover would lay the situation before Congress in a special message. On Dec. 7 some 1,500 Haitians from the interior attacked a marine patrol near the city of Aux Cayes, and were repulsed. Five hundred marines were rushed to the scene of unrest.

President's Message.—The same day President Hoover sent a special message to Congress. "In my message," said the President, "to Congress of the 3rd instant I indicated my concern as to the future of our policies in Haiti. I stated that we have there about 700 marines, and that we are confronted with a difficult problem, the solution of which is still obscure. I further stated that if Congress approves, I shall dispatch a commission to Haiti to review and study the matter in an endeavor to arrive at some more definite policy than at present.

"Our representatives in Haiti have shown great ability and devotion and have accomplished signal results in improvement of the material condition of that people. Yet our experience has revealed more clearly than was seen at first the difficulties of the problem, and the entire situation should be reviewed in the light of this experience.

"Since the dispatch of my message, disturbances in Haiti emphasize the importance of such an investigation and determination of national policies in the immediate future.

" . . . I feel that it is most desirable that the commission mentioned in my message of Dec. 3 be constituted and sent to Haiti without delay, and I, therefore, request the Congress to authorize the immediate sending of such a commission and to appropriate for this purpose $50,000. It is my intention to include one or two members from each house of Congress on this Commission."

American Commission.—During January the United States Senate indulged in no little criticism of our policy which prompted a statement from President Hoover that a commission would be appointed to study the whole problem of the occupation of the Island Republic by American troops. He further hinted that we would be out of the Island by 1936. The personnel of the commission was announced as follows: W. Cameron Forbes, former Governor General of the Philippines, Chairman; Henry P. Fletcher, former Ambassador to Mexico, Chile, Italy, and Belgium; James Kerney, journalist; William Allen White, Elie Veniza.

Election Supervision.—Word came to the United States in February that the opponents of President Borno were much concerned about the election to be held in April. They were demanding that the president be elected by popular vote under the general supervision of United States officials. Petitions were sent President Hoover asking that the United States supervise the elections as we had done in Nicaragua. The disturbance in Haiti gave the critics of American policy in the Island an opportunity further to criticize American "Imperialism."

Statement of Policy.—The Hoover Commission reached Port Au Prince the end of February. It immediately made known its policy in the following public statement: "The offices of the commission will be open daily from 9 to 5 for receiving information and making appointments for those who care to appear in persons before the Commission. It is the desire of the Commission that all elements of the Haitian people be heard freely and frankly. Citizens who for any reason desire a private interview will be welcome, and their communication will be treated as confidential. The Commission will pursue the same course of hearing and interviews at other points in the Republic. The purpose of the mission is to gather as completely as possible all the facts concerning the situation." Complaints and protests regarding American occupation and the coming election were given special attention by the Commission.

Plan for Government.—March 7 the Commission in a wireless to President Hoover recommended the restoration of representative government in accordance with a plan already approved by President Borno. President Hoover agreed to the following plan: The groups opposing the government then in power were to choose delegates to a meeting at Port Au Prince. This gathering was to select a candidate for temporary President. The temporary President was to be neutral on politics and acceptable to President Borno. He was to call popular elections for the Senate and the Chamber of Deputies which had been dissolved under American occupation. These elections were to be scheduled for August and the legislature to meet in September and elect a constitutional president.

Election of Roy.—In accordance with this agreement, Eugene Roy, a non-partisan business man, was elected Provisional President by the Haitian Council of State on April 21 to succeed President Borno at the conclusion of the latter's term, May 15. There was some question as to the selection of Roy but a dispatch from the American State Department to the effect that the United States Government would recognize no one but Eugene Roy as Provisional President brought the matter to a head. Roy was inaugurated May 15.

Congressional Elections.—On Oct. 14 were held the Congressional elections, the first under the Constitution of 1918. These elections were carried out in accordance with the recommendations of the Forbes Investigating Committee. The results indicate that of the fifteen senators and thirty-six deputies elected, the majority belong to the Nationalist party opposed to the continuing occupation of Haiti by American military forces. One of the first duties of the new Congress will be the election of a permanent president to succeed Provisional President Roy.

NICARAGUA

Withdrawal of Marines.—Late in November, 1929, Secretary of State Stimson announced that it was the intention of the United States to withdraw the present force of 1,200 marines from Nicaragua as rapidly as conditions permitted. Both Liberals and Conservatives seemed to oppose the immediate withdrawal.

Mining Concession. — Another business transaction that has significance for American relations in the Caribbean was the consummation in February of a contract between the Ministry of Public Works of Nicaragua and the Tonopah Mining Company of Nevada, which granted to the company a twenty-five-year concession to exploit mineral deposits in the public lands of the Department of Prinzopolca.

Colombia Treaty.—Of some importance in connection with American-

Nicaraguan relations was the ratification, April 4, of a treaty between Nicaragua and Colombia. This treaty recognized Nicaragua's claim to the Mosquito Coast and the Great Corn and the Little Corn Islands in the Caribbean. The United States leased these Islands from Nicaragua in 1916 for a term of 99 years.

Election Supervision.—It was announced in early summer that Capt. Alfred W. Johnson of the U. S. Navy was appointed by the American Government to serve as president of the Nicaraguan Council of Elections. He was to supervise the Congressional elections in October at the request of the Nicaraguan Government. Aug. 2 some 280 picked men from the U. S. Navy arrived in Nicaragua to continue training in preparation for the work to be done by Capt. Johnson's Commission. Aug. 14 President Moncada, in an address of welcome to the American Electoral Supervisory Mission, pointed out that the coöperation of the Mission would "demonstrate to the world" that they had "not come for any selfish interest but for that liberty that has been the light of your country."

Fiscal Agency.—Another announcement of considerable interest to banking circles was one given publicity on June 10 to the effect that the International Acceptance Bank of New York would act as the fiscal agent of the Pacific Railroad of Nicaragua and the National Bank of Nicaragua. Representatives of the American corporation were appointed to the boards of the two Nicaraguan corporations in an advisory capacity.

Seaport Project. — Aug. 1 the American State Department announced that it was acceding to the request from the Nicaraguan Government to aid it in the selection of a site on the Gulf of Fonseca at which a Nicaraguan seaport might be established. In view of the fact that the United States has a monopoly over the proposed canal route across Nicaragua, with its western terminus on the Bay of Fonseca, this willingness to aid Nicaragua in her seaport project assumes no little importance.

Congressional Elections. — Much interest was attached to the Congressional elections held Nov. 2. With incomplete returns, the results seem to indicate that the Liberals were leading in a majority of the districts. One of the strongholds of the Conservatives, a district in Granada, was carried by the Liberals. In these elections, which were supervised by marine officials of the United States, one-half of the membership of the Chamber of Deputies, and one-third of the membership of the Senate were elected. There were no disturbances of great consequence.

CUBA

Arbitration of Barlow Claims.—In February word came from U. S. Ambassador Guggenheim at Havana that the Cuban Government was willing to arbitrate the long-standing claims of Joseph E. Barlow, an American resident of Havana. Barlow alleged that the Cuban Government had confiscated property valued at over $9,000,000. These claims in the last few years have furnished the basis for a number of diplomatic exchanges between the Departments of State of the United States and Cuba. Also, the Foreign Relations Committee of the United States Senate has undertaken an investigation of the affair. The American State Department made it known early in May that the United States "had declined to take any action in the case of Joseph E. Barlow." The Foreign Relations Committee of the Senate investigated the Barlow claims and announced that it was satisfied with the report of Ambassador Guggenheim upon which the action of the Department of State was based.

American Loan.—A transaction of considerable interest was the negotiation by the Cuban Government, early in the year, of a loan of $80,000,000 through the Chase National Bank of New York. Some $20,000,000 of this amount became available immediately.

Japanese Treaty.—It was announced in August that a treaty had been negotiated between Cuba and Japan; one in which the United States was particularly interested. It guarantees the contracting parties the enjoyment of the most favored nation privileges, but recognizes the special rates under Cuba's tariff law which was based upon the treaty of commercial reciprocity between the United States and Cuba. Another angle of the treaty which should interest Americans is the provision it makes for the immigration of Japanese into Cuba. It is reported that an increasing number of Japanese are going to Cuba.

Parcel Post and Tariff.—It was reported from Washington in the summer that a new parcel post convention between the United States and Cuba had been signed. This brought to an end a long controversy over tobacco shipments between the two countries. President Machado in an interview in the latter part of July denied that Cuba was planning reprisals in connection with the new United States tariff. Cuba was seriously affected by this tariff.

Walsh Statement.—The press carried dispatches Sept. 21, quoting from a statement issued by Senator Walsh, who had just returned from a visit to Cuba. He pointed out that unemployment and poverty were materially contributing to political unrest in Cuba. It was his opinion that recent events in South American Republics might be duplicated in Cuba unless the influence of the United States were exerted to head off the trouble. He was emphatic in saying that something should be done either by Cuba, or the United States, or by both, in averting economic collapse and political disturbances. He felt, however, that we should assure the Cuban people of their sovereign rights in governing themselves.

American Policy.—Sept. 22, the day after Senator Walsh issued his statement, the American State Department gave out a statement to the effect that it was not particularly alarmed over the situation in Cuba. It further stated that the Hoover Administration would follow the policy of the McKinley Administration of 1901. Under the Platt Amendment the United States may "interfere for the protection of Cuban independence, the maintenance of a government adequate for the protection of life, property, and individual liberty." Elihu Root, Secretary of State in the McKinley Administration, had interpreted this provision as not giving the United States grounds for "intermeddling" in the internal affairs of Cuba. The Hoover Administration would take the same ground.

SANTO DOMINGO

It was reported in April that Dr. Rafael Brachi, Minister from the Dominican Republic, when presenting his credentials to President Hoover, had warmly commended the President's Caribbean policies. June 3 Provisional President Estrella Urena expressed a fear before the Chamber of Commerce of Santo Domingo that the sovereignty of the island republic was jeopardized by the $10,000,000 loan in the United States which had been incurred by a former administration. He intimated that in case revenues were insufficient to meet these payments, the United States might take over control under the Conventions of 1907 and 1924. The American Government has promised every possible aid to the Dominican Republic in its attempt to arrange a loan for hurricane relief. There is an existing agreement between the United States and Santo Domingo to the effect that all loans negotiated by the latter must be passed upon by the American State Department.

PANAMA

American-Panaman relations in 1930 seemed to move along much the same friendly lines as in 1929. Sept. 1 Dr. Harmodio Arosemena, President of Panama, delivered his presidential message to the National Assembly. He stressed the cordial relations subsisting between the United States and Panama.

MARITIME JURISDICTION

By Charles E. Hill

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CODIFICATION OF THE LAW OF TERRITORIAL SEA

The League Conference.—Representatives of forty-eight powers met at the Hague, March 13, 1930. The delegates from the United States were David Hunter Miller, Green H. Hackworth, Theodore G. Risley, Richard W. Flournoy, Jr., and Ruth B. Shipley. The technical advisers for the American delegation were Professors J. Reeves, E. Borchard, and M. Hudson, Commander Corwin, Mr. Boggs, and Miss Wold. Three phases of international law were considered ripe for codification: nationality, responsibility of states, and territorial waters. Five years' notice had been given to the various governments, which afforded ample time for preparation. Preliminary projects had been drafted with care. Dr. Göppert of Germany presided with skill and tact over the committee on the law of the territorial sea. M. Francois of The Netherlands served as *rapporteur*.

Maritime Belt.—The committee agreed on a minimum of three miles for the maritime belt. The only countries that favored three miles as a maximum for all purposes were Great Britain, The Dominions, and Japan. Italy favored six miles with special rights for a further six miles. With the exception of Chile, the Latin American countries favored six miles. Finland, Norway, Sweden, and Iceland preferred four. Several countries, Chile, France, Germany, Belgium, Egypt, favored the three-mile limit with a contiguous zone The United States expressed no opinion. As a matter of fact it has two contiguous zones, the twelve-mile limit for customs purposes and the hour's run from shore for the prevention of smuggling of liquor. In each instance the opinions of the delegates reflected largely the legal conditions prevailing in the home state.

Innocent Passage.—This was given a negative definition as not innocent when the vessel makes use of territorial sea for the purpose of doing any act prejudicial to the security, to the public policy, or to the fiscal interests of the coastal state. The passage of foreign war vessels through the territorial sea was not recognized as a right, but it was agreed that the coastal state would not as a general rule forbid the passage of foreign warships in its territorial sea or require previous notification. Submarines should navigate on the surface.

Hot Pursuit.—It was given a more strict definition than applies at present. Hot pursuit "shall only be deemed to have begun when the pursuing vessel has satisfied itself by bearings, sextant angles, or other like means that the pursued vessel or one of its boats is within the limits of the territorial sea, and has begun the pursuit by giving the signal to stop. A capture on the high seas shall be notified without delay to the state whose flag the captured vessel flies." Hot pursuit may be undertaken for an infringement of the laws and regulations of the coastal state. It may be continued so long as the pursuit has not been interrupted and until the vessel enters the territorial sea of its own country or of a third state.

Fisheries—Bays.—No agreement was reached about fisheries within the territorial sea. Neither could they agree on the width of the mouth of a bay in order to make it a closed sea; some favored six and some ten miles in width. Two different methods of measuring bays, the French proposal and the American proposal, were apparently adopted.

Islands.—A long discussion took place on the definition of an island. They agreed on a slight variation of the usual school-boy concept; "an area of land surrounded by water and permanently above the high water mark." It was admitted that every island has its own territorial sea.

Provisional Agreements. — The

agreements reached were recognized as provisional with a view to possible incorporation later in a convention. The conference represented, however, the first effort to codify the principles of international law on the subject. Even though no country may formally adopt the agreements reached, yet the courts in many states will recognize the guiding value of the deliberations.

INTERNATIONAL PROTECTION OF WHALES

Draft Convention, Berlin.—A committee of experts chosen by the Council of the League met in Berlin in April, 1930, and drafted a convention for the protection of balen whales. Since 30,000 whales are killed annually and since half of the whale oil supply is furnished by Norwegian companies, it was proper that they should take the Norwegian law of June 21, 1929, as a basis for discussion. As a result a draft of a convention was submitted to the Economic Committee of the League. It requires complete utilization of the carcass, restriction on gunners' contracts, the elimination of pay on the basis of the size of the kill, the licensing of whaling vessels, and the prohibition of the killing of young whales and of females accompanied by young.

WEATHER SIGNALS

International Exchange. — By agreements entered into by the meteorological services of many nations at the meeting of the International Meteorological Organization at Copenhagen, September, 1929, the interchange of weather reports was reorganized. Standard hours and universal codes were agreed upon. The ships of a state were to furnish observations in proportion to the tonnage of that state. The warnings and general forecasts are transmitted to ships at sea by radio twice daily. Naval radio stations perform this service for the United States.

Duty to Heed.—Vessels at sea and in territorial waters must heed the warnings of the Weather Bureau or take the consequences in case of damag suits. (The *Sea King*-29F (2) 6.) It has also been held that the owner of a barge torn from its moorings by storm was negligent in not heeding the warnings of the Weather Bureau even though he did not know that the warnings were out. The inference is that it was his duty to keep himself informed. (Osaka Shosen Kabushiki *vs.* U. S. Lighter No. 1 D.C.E.D., N.Y., January, 1929.)

PART THREE

GOVERNMENTAL FUNCTIONS

DIVISION VII

PUBLIC FINANCE AND TAXATION

NATIONAL EXPENDITURES AND REVENUES

By Merlin H. Hunter

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TREND AND EMPHASIS IN NATIONAL FINANCE

The Budget.—The Budget and Accounting Act, adopted in 1921, provides that the President, on the first day of each regular session of Congress, shall transmit the Budget. In this he is to set forth estimates of all money needed by the government for the coming fiscal year; estimates of all receipts for the coming year; estimates of receipts and expenditures for the current year; conditions of the public debt; and other statements which he may think necessary to show the financial condition of the government. The Budget transmitted by President Hoover for the service of the fiscal year ending June 30, 1931, indicated the state of the national finances. The following summary of estimates of appropriations for 1931 and appropriations for 1930 shows the relative importance of different Federal activities.

ESTIMATES OF APPROPRIATIONS, 1931, AND APPROPRIATIONS, 1930

	Estimates of Appropriations, 1931	Appropriations, 1930
Legislative Establishment:		
Senate	$ 3,232,764.00	$ 2,951,651.60
House of Representatives	8,153,394.00	7,580,361.00
Architect of the Capitol	11,084,346.98	2,506,800.40
Botanic Garden	173,790.00	173,060.00
Library of Congress	2,248,722.00	2,068,612.00
Government Printing Office	3,270,000.00	3,419,000.00
Miscellaneous	182,050.00	166,960.00
Total, legislative establishment	$ 28,345,066.98	$ 18,866,445.00
Executive Office	$ 422,320.00	$ 447,220.00
Independent establishments:		
Alaska relief funds	15,000.00	15,000.00
American Battle Monuments Commission	1,000,000.00	600.000.00
Arlington Memorial Bridge Commission	1,000,000.00	2,000,000.00
Board of Mediation	328.380.00	302,270.00
Board of Tax Appeals	690,000.00	663,863.00
Bureau of Efficiency	1,224,330.00	224,330.00
Civil Service Commission	1,362,952.00	1,226,862.00
Commission of Fine Arts	9,080.00	9,080.00
Employees' Compensation Commission	4,210,000.00	4,073,326.00
Federal Board for Vocational Education	8,420,400.00	8,799,520.00
Federal Farm Board[1]	1,900,000.00	151,790,000.00
Federal Oil Conservation Board	22,220.00	....
Federal Power Commission	187,250.00	179,500.00
Federal Radio Commission	168,610.00	164,440.00
Federal Reserve Board	2,560,336.00	2,605,741.00

	Estimates of Appropriations, 1931	Appropriations, 1930
Federal Trade Commission	1,437,460.00	1,277,760.00
General Accounting Office	4,181,000.00	4,092,000.00
Housing Corporation	298,950.00	243,450.00
Interstate Commerce Commission	10,329,963.00	7,548,825.00
Mount Rushmore National Memorial Commission	60,000.00	....
National Advisory Committee for Aeronautics	1,321,000.00	1,292,200.00
Porto Rican Hurricane Relief Commission	1,000,000.00	....
Protecting interests of the United States in oil leases and oil lands	....	100,000.00
Public Buildings and Public Parks of the National Capital	3,591,640.00	2,888,061.00
Public Buildings Commission	100,000.00	....
Smithsonian Institution	1,189,683.00	1,106,183.00
Tariff Commission	825,000.00	789,000.00
United States Geographic Board	14,660.00	9,200.00
United States Shipping Board and Merchant Fleet Corporation	6,396,000.00	11,494,000.00
United States Veterans' Bureau	589,755,000.00	597,375,000.00
Total, Executive Office and independent establishments	$ 643,021,234.00	$ 801,316,831.00
Department of Agriculture	$ 165,088,506.00	$ 155,729,990.00
Department of Commerce	52,382,270.00	58,795,609.00
Department of the Interior	304,302,347.74	311,346,075.78
Department of Justice	32,017,292.00	27,937,370.00
Department of Labor	12,219,770.00	10,774,430.00
Navy Department	380,392,526.00	362,061,247.00
Post Office Department:		
Postal Service payable from postal revenues	760,470,577.00	734,235,725.00
Postal deficiency payable from Treasury	78,500,000.00	84,000,000.00
State Department	17,238,659.14	14,794,945.68
Treasury Department	348,107,000.00	342,631,715.80
War Department, including Panama Canal	466,626,332.00	463,452,777.00
District of Columbia	47,880,228.00	44,540,115.00
Total, ordinary, including Postal Service	$3,336,591,808.86	$3,430,483,276.26
Reduction in principal of the public debt:		
Sinking fund	$ 395,624,000.00	$ 382,720,000.00
Other redemptions of the debt	239,700,000.00	241,174,100.00
Principal of the public debt	635,324,000.00	623,894,100.00
Interest on the public debt	619,000,000.00	656,000,000.00
Total, including Post Office Department and Postal Service	$4,590,915,808.86	$4,710,377,376.26
Deduct Postal Service payable from postal revenues	760,470,577.00	734,235,725.00
Total, payable from the Treasury	$3,830,445,231.86	[1]$3,976,141,651.26

[1] $150,000,000 included in appropriations for 1930 for Federal Farm Board revolving loan fund. No corresponding figure included for 1931.

Federal Farm Board Fund.—It will be noted that the estimate contains no request for funds for the revolving loan fund for the Federal Farm Board. The 1930 Budget carried $150,000,000 for this item. The President indicates, however, that he is simply delaying his estimate until it is more definitely known how much will be needed. He also indicates that justified reductions in some items makes possible an enlarged program for other activities. The most important increases and decreases are indicated in the following table:

INCREASES AND DECREASES IN ESTIMATED APPROPRIATIONS, 1931

	Increases	Decreases
Legislative Establishment:		
Enlarging and improving the Capitol grounds	$3,600,000	....
New House Office Building	1,500,000	....
Completion of Senate Office Building	2,700,000	....
Building for Supreme Court	1,000,000	....

	Increases	Decreases
Independent Establishments:		
Arlington Memorial Bridge Commission	....	$1,000,000
Federal Farm Board revolving loan fund	....	....
(Note.—An estimate for 1931 will be submitted later when the amount required can be more definitely determined.)		
Interstate Commerce Commission	2,800,000	....
Porto Rican Hurricane Relief Commission	1,000,000	....
Shipping Board Merchant Fleet Corporation	....	5,100,000
Veterans' Bureau—		
Salaries and expenses	2,000,000	....
Military and naval compensation	4,550,000	....
Medical and hospital services	3,950,000	....
Military and naval insurance	4,750,000	....
Construction of hospital facilities	....	4,000,000
Government life insurance fund	....	18,870,000
Department of Agriculture:		
Forest Service	3,300,000	....
Plant quarantine and control	1,100,000	....
Public roads	2,500,000	....
Department of Commerce:		
Aeronautics branch	2,500,000	....
Bureau of the Census	....	10,500,000
Department of the Interior:		
Indian Service	3,100,000	....
Indian trust funds	....	4,500,000
Army and Navy pensions	....	7,000,000
Department of Justice:		
Expenses, etc., United States courts	1,100,000	....
Penal and correctional institutions	2,250,000	....
Department of Labor: Immigration and naturalization	1,150,000	....
Navy Department:		
Pay, subsistence and transportation	3,100,000	....
Alterations to naval vessels	6,950,000	....
Increase of the Navy	3,250,000	....
Public Works	2,300,000	....
Post Office Department: Postal deficiency	....	5,500,000
State Department: Foreign Service	1,800,000	....
Treasury Department:		
Refunding taxes illegally collected	10,000,000	....
Bureau of Prohibition	1,275,000	....
Coast Guard	2,450,000	....
Construction of Public Buildings	....	9,025,000
War Department:		
Buildings at military posts	1,600,000	....
Other Quartermaster Corps items	2,650,000	....
Air Corps	1,100,000	....
Ordnance items	1,700,000	....
Citizens' military training	1,500,000	....
Maintenance and improvement of rivers and harbors	5,000,000	....
Flood control	....	....
Return of funds contributed for flood control	5,000,000	4,370,000
Inland waterways corporation	....	10,000,000
Restoration of roads and bridges in various States (transferred to Department of Agriculture)	....	3,650,000
Soldiers' homes	1,100,000	....
Panama Canal	1,850,000	....
District of Columbia	3,300,000	....
Public debt:		
Reduction in the principal of the public debt	11,500,000	....
Interest on the public debt	....	37,000,000

Analysis of Increases In Estimated Appropriations.—One of the important increases in the above estimates is that for rivers and harbors and flood relief. The increase is $5,000,000 for flood control and $5,000,000, for rivers and harbors. The competition of the construction work on the Ohio River will also release about $5,000,000 to be used in other river and harbor work. The cost of the Boulder Dam project is not included in the above estimate. The duties of the departments of State and Justice are so important in the conduct of foreign affairs and in law enforcement and the administration of the penal system that the President felt additional funds were necessary. The increase asked for the Deparment of State is more than $2,443,000, or an increase of about 16½ per cent while that for the Department of Justice is more than $4,079,000, or about 14½ per cent. The President asks an increase of $3,100,000, to meet more fully our obligations to the Indians. The need lies in educational and health work and for industrial assistance and advancement. For forest protection, also, he asks for an increase of more than $2,000,000. As custodian of the national forests, national parks, and other public lands, the Federal Government is responsible for their protection. The obligations of this stewardship cannot be met within the limits of the present appropriation, and the President therefore requests the increase.

PUBLIC BUILDING PROGRAM

The public building is now proceeding at a satisfactory rate of progress. At the outset unavoidable delays were experienced because of difficulties encountered in acquiring sites, it being necessary in some cases to resort to condemnation proceedings in the courts. It is now expected that there will be completed 34 new or enlarged buildings in 1930 and 40 in 1931. The program calls for a total expenditure of approximately $300,000,000 in addition to the proceeds of the sale of abandoned property. The War Department is also carrying forward a building program involving an ultimate expenditure of about $118,000,000 for the housing of military personnel made necessary by the need for replacement of World War temporary construction and to provide for the increase in the pre-war strength of the regular army. Other building operations include hospital facilities for the Veterans' Bureau, new construction for the Indian service, construction at the federal penitentiaries, and for houses and offices of the foreign representatives. As a whole the Budget carries estimates of more than $59,200,000 for the construction of buildings, including the procurement of sites, with a contract authorization for a further expenditure of $3,000,000. To this there should be added an additional $5,000,000 for a public building program, the estimate for which has not been presented.

NATIONAL DEFENSE

Military and Naval.—The estimates for direct appropriations for the War and Navy Departments for 1931 provide a total of $719,089,000 for national defense. This is exclusive of all items of a non-military character. In addition to the normal maintenance and operation requirements of these two departments, provision is made for carrying forward the Air Service programs of the two services, the housing program of the Army, and the requirements of the Navy with regard to the modernization of old battleships and the construction of new ships authorized by the act of Feb. 13, 1929, as well as the light cruisers and submarines authorized by prior law. With regard to the 15 new cruisers authorized by the act of last February, provision is made for continuing work on the two cruisers already laid down and on the aircraft carrier and three cruisers to be laid down late in the fiscal year 1930 and for the commencement of the construction of the second and third blocks of five cruisers each, late in the fiscal year 1931.

Air Service.—Under the air service program for the army and navy, the Budget calls for $3,000,000 for the procurement of airplanes, their engines, spare parts, and accessories. In addition, for the same purposes for the coast guard, Department of Commerce, and the National Advisory Committee for Aeronautics there is a request for $460,000. In addition to the amounts spent for the acquisition of aircraft, large sums are also spent for lighting and equipping airways, the inspection and licensing of commercial planes and pilots, and furnishing weather reports necessary to the carrying on of aerial navigation. On this account the estimates of the Department of Commerce contain $8,925,830 and in those of the Weather Bureau the sum of $1,400,000. It is estimated that by the end of 1931 there will be about 18,400 miles of airways lighted and equipped.

VII. PUBLIC FINANCE AND TAXATION

SUMMARY OF UNITED STATES GOVERNMENT REVENUES

Sources of Revenue, Exclusive of Postal Revenues

	Estimated, 1931	Estimated, 1930	Actual, 1929
Revenue receipts:			
Customs receipts	$ 602,000,000.00	$ 602,000,000.00	$ 602,262,786.17
Internal-revenue receipts	3,100,000,000.00	3,115,000,000.00	2,938,019,371.64
Miscellaneous taxes	12,427,000.00	12,437,000.00	9,060,602.21
Interest, exchange and dividends on capital stock	195,586,371.00	158,571,575.00	170,676,025.40
Fines and penalties	8,300,250.00	8,273,250.00	7,962,248.88
Fees	21,664,415.00	19,732,415.00	15,592,599.76
Forfeitures	1,426,516.00	1,353,128.00	1,419,800.52
Assessments	7,731,300.00	7,506,000.00	7,221,709.07
Reimbursements	9,951,925.00	10,022,515.00	10,844,964.30
Gifts and Contributions	2,904,820.00	3,184,281.00	3,103,215.36
Sales of Government property—products	4,397,085.00	4,357,887.00	3,843,986.71
Sales of services	31,368,515.00	31,479,715.00	31,421,128.34
Rents and royalties	6,540,625.00	6,785,325.00	7,279,147.57
Permits, privileges and licenses	1,984,845.00	2,012,945.00	1,772,968.41
Mint receipts (Profits on coinage, bullion deposits, etc.)	6,038,600.00	6,038,600.00	5,373,407.13
Forest-reserve fund	6,650,000.00	6,440,000.00	6,312,463.49
Postal receipts, Panama Canal	....	192,000.00	150,976.08
Non-revenue receipts:			
Army costs due the United States from Germany, Paris agreement of Jan. 14, 1925	6,025,000.00	10,620,000.00	13,498,355.28
Repayments of investments	63,694,699.00	103,884,263.00	57,101,430.66
Sales of public lands	300,000.00	300,000.00	314,568.43
Sales of Government property	4,319,400.00	6,854,510.00	10,362,053.67
Trust funds	95,867,800.00	96,446,800.00	96,643,142.87
District of Columbia:			
Revenue receipts—			
District of Columbia share (non-revenue to United States)	33,498,500.00	32,556,225.00	31,449,620.00
United States share (revenue to United States)	50,000.00	50,000.00	52,417.19
Total revenue receipts	$ 33,548,500.00	$ 32,606,225.00	$ 31,502,037.19
Non-revenue receipts—			
District of Columbia share	3,000,000.00	3,165,000.00	2,080,643.17
Total miscellaneous receipts under District of Columbia	$ 36,548,500.00	$ 35,771,225.00	$ 33,582,680.36
Total miscellaneous receipts, including Panama Canal and Sales of public lands—			
Revenue receipts	$ 317,022,267.00	$ 278,436,636.00	$ 282,087,659.42
Non-revenue receipts	206,703,399.00	253,826,798.00	211,449,814.18
Adjustment between cash and warrant distribution	....	....	569,406.36
Total miscellaneous receipts	$ 523,727,666.00	$ 532,263,434.00	$ 492,968,067.24
Total ordinary receipts, exclusive of postal revenues	$4,225,727,666.00	$4,249,263,434.00	$4,033,250,225.05

Relation of Receipts to Expenditure.—The relation of total receipts to total expenditure may be seen from the following table which gives a brief summary of both items.

SUMMARY OF RECEIPTS AND EXPENDITURES

(Exclusive of Postal Revenues and Postal Expenditures Paid from Postal Revenues)

Receipts:	Estimated, 1931	Estimated, 1930	Actual, 1929
Customs	$ 602,000,000	$ 602,000,000	$ 602,262,786.17
Income tax	2,460,000,000	2,480,000,000	2,330,711,822.66
Miscellaneous internal revenue	640,000,000	635,000,000	607,307,548.98
Miscellaneous receipts	523,272,666	532,263,434	492,968,067.24
Total receipts	$4,225,727,666	$4,249,263,434	$4,033,250,225.05
Total expenditures (including reduction of the public debt required by law to be made from ordinary receipts)	$4,102,938,700	$4,023,681,900	$3,848,463,189.63
	$ 122,788,966	$ 255,581,534	$ 184,787,035.42

TAXATION

Tax Reduction.—Federal officials as well as the public continue to be interested in tax reduction. The following quotation from the Budget message of President Hoover illustrates the attitude: "With an estimated surplus of over $225,000,000 this year and $122,000,000 next year it is felt that some measure of reduction in taxes is justified. Since the fiscal year 1921 four reductions in taxes have been made. Experience has shown that each reduction in taxes has resulted in revenue in excess of the mathematically computed return under the reduced rates. Undoubtedly an increase in the prosperity of business brought forth by tax reduction is partly responsible for this experience. Such reduction gives the taxpayer correspondingly more for his own use and thus increases the capital available for general business. Under the present circumstances I am in favor of a reduction in income taxes to be effective on returns for the calendar year 1929, which will be due March 15, 1930. Payment under these returns will be made during the last half of the current fiscal year 1930 and the first half of the coming fiscal year 1931, so that the reduction will be reflected in the two years for which we now anticipate a surplus. I therefore recommend that taxes upon incomes for the calendar year 1929 be reduced in the approximate sum of $160,000,000. I would suggest to the Congress that this be effected, as recommended by the Secretary of the Treasury, by reducing by one per cent the rate of the normal tax on the incomes of individuals and corporations, applicable to 1929 incomes and payable in the calendar year 1930. This will afford either directly or indirectly relief to the maximum number of taxpayers. Our effort will be to conduct our financial requirements so as to continue the benefits of reduced taxation for succeeding calendar years. It would not, however, at this time be safe to extend the period of the reduction. A year hence we will know more definitely whether the condition of our finances justifies a continuation or extension of the reduction."

International Double Taxation.—One of the subjects to which much attention has been directed by the Geneva Conference has been that of international double taxation. Many European countries have entered into agreements designed to eliminate such taxes, but as yet uniformity has not been secured. The Secretary of the Treasury in his report for the year 1929, p. 27, reaches the following conclusion on the subject: "Taking into account the nature of the various tax systems, the basic principles of the model conventions drafted at the Geneva Conference, and the interests of the United States, the American section of the International Chamber of Commerce drafted a uniform code of principles for eliminating the double imposition of income, property, and estate taxes. This code was subsequently adopted by the Congress of the International Chamber of Commerce, which recommends that states adopt, either unqualifiedly or on condition of reciprocity, the principles contained therein as the simplest and most equitable to observe in revising their revenue legislation and in concluding international treaties. As double taxation impedes considerably the expansion of commerce, no country has a more vital interest in preventing it than the United States. The United States has already incorporated in its revenue act certain measures to prevent double taxation, but much more can be done."

OPERATIONS OF THE TREASURY DEPARTMENT

The treasury department closed the year on June 30, 1930, with a surplus of about $184,000,000, which is about the same as the surplus for the preceding year. The debt has been further reduced until it is not but a little more than $16,000,000,000 in comparison to $26,500,000,000 in 1919. The surplus and reduction of debt were possible in the face of lower income tax rates, since the normal rates on personal income and the rate on corporate income were each reduced by one per cent. The Bureau of Internal Revenue has done much to effect improvements which have meant a reduction of both personnel and costs of collecting taxes. The building recently erected to house the activities of the Bureau will further add to its efficiency. Much has been done, also, to encourage a better relationship between the officials of the Bureau and the taxpaying public. The transfer from the Treasury of the administration of parts of the Prohibition Act is also an important change.

CONDITIONS OF FEDERAL FINANCES

At the conclusion of his budgetary message President Hoover had this to say concerning the state of the finances: "Our finances are in sound condition. The public debt which at its peak in August, 1919, amounted to $26,596,000,000, stood at $16,931,000,000 on June 30, 1929. We are wisely committed to a policy which insures the further progressive reduction of the debt. We will reach in 1931 for the first time the period when the annual reduction required by law in the principal of the debt will be greater than the annual interest charges on the debt. We are also committed to the annual amortization of our other long term committments—such as the adjusted service certificate of the veterans of the World War and our liability under the retirement laws affecting civilian personnel. Our estimated expenditures for this and the next year are well within our expected receipts. With the recommended reduction in taxes the margin between the two will be considerably lessened, but to what extent we do not definitely know today. This situation emphasizes the necessity for a careful scrutiny of any proposed additional activities which would involve a material increase in expenditures in order that we may not jeopardize either the balanced condition of the Budget or the continuation of the benefits of reduced taxation."

THE NATIONAL BUDGET

By A. E. Buck

National Institute of Public Administration

FORMULATION OF THE 1931 BUDGET

President's Budgetary Policy.—The preparation of the Budget for 1931, covering the fiscal year beginning July 1, 1930, was begun in the summer of 1929. President Hoover departed from the practice of his predecessor in discontinuing the semiannual meetings of the "Business Organization of the Government," which had for some eight years been regularly held in January and June. President Coolidge had customarily announced his "policy" at the June meeting concerning the preparation of the next budget. In lieu of this method of procedure, President Hoover gave out through the Budget

Bureau his ideas with respect to the planning of the budget for 1931. The Acting Director of the Budget, R. O. Kloeber, was the spokesman for the President in announcing that the gross figures of the 1931 budget were to be held down to the aggregate amount (approximately $3,800,000,000) appropriated for the fiscal year ended June 30, 1930. Mr. Kloeber also stated that the President wished to "restore" to the department heads full responsibility for effecting economy in Federal expenditures.

The Estimates.—Near the end of June, 1929, the Budget Bureau asked the various departments and establishments for preliminary estimates and sent each one a set of sheets from the budget for 1930 with instructions to indicate such estimates thereon. It was made clear that these were not the regular estimates which were to be submitted Sept. 15. The preliminary estimates reached the Budget Bureau about the middle of July, and examination was begun by the staff of the Bureau and continued until the early part of September. Revised figures of the preliminary estimates, aggregating $3,865,666,143, were then apportioned to the spending departments and agencies as a basis for the preparation of regular estimates which were again scrutinized by the Bureau staff in preparing the final figures for the President's budget. This work was carried on under the new Director of the Budget, J. Clawson Roop, appointed by President Hoover Aug. 15, to succeed the late General Lord. As the work of reviewing and revising the regular estimates proceeded, it became apparent that the final figures would exceed the aggregate appropriations made for the fiscal year then current, assuming that allowances were made for certain extraordinary expenditures of a nonrecurrent nature. This was explained by the fact that certain new activities and projects approved by Congress, such as farm relief, government building programs, Mississippi flood control, and Boulder dam project, had added large expenditures to the national budget. In addition to these new things, there was a considerable increase in the postal deficit over that of the previous fiscal year.

The Budget Document.—The budget for 1931 was completed and the budget document transmitted to Congress by President Hoover Dec. 4, 1929. It carried expenditure proposals totaling $3,830,445,231.86, exclusive of $760,470,577 for the postal service payable from the postal revenues, making a grand total of $4,590,915,808.86. The revenues available to meet these proposed expenditures were estimated at $4,225,727,666, exclusive of the postal revenues. After deducting the total proposed expenditures, including an amount for reduction of the public debt required by law to be made from ordinary receipts, or $4,102,938,700, an estimated surplus of $122,788,966 remained. The preceding year's surplus was estimated at slightly over $225,500,000. On the strength of this large estimated surplus, President Hoover recommended in his budget message that Congress reduce the taxes on incomes for the calendar year 1929 by approximately $160,000,000. He said that he hoped future conditions would make it possible to continue the policy of reduced taxation, and progressive reduction of the debt. Provisions were made in the 1931 budget for speeding up the public building program, which called for a total expenditure of approximately $300,000,000 in addition to the proceeds from the sale of abandoned property. These were discussed at some length by the President in his budget message. The postal deficit, amounting to $85,461,176 June 30, 1929, compared with slightly more than $32,000,000 the year before. The Postmaster General explained that the major part of the increase was due to free service for government departments, franked mail, air mail deficiencies, and ocean mail subsidies.

CONGRESSIONAL ACTION ON THE BUDGET

Appropriation Bills.—The House Committee on Appropriations, under the chairmanship of Rep. William R. Wood, started preparation of the regular appropriation bills more than a month before the President's budget was submitted to Congress, but the budgetary recommendations of the President were known to this committee, of course. Chairman Wood announced before the congressional session opened that he hoped to have all the annual appropriation bills enacted by the first week in March. He also stated that he did not see any prospect of keeping down the annual cost of operation of the Federal Government in view of the constantly augmented business activities of the country with which the government must keep pace. All regular annual appropriation bills were passed by the House before March, 1930, as Chairman Wood had planned. But the Senate Committee on Appropriations lagged behind in its work, so that only two of the bills—the first deficiency bill and the Agricultural Bill—were passed by the Senate before the end of March. The others were passed from time to time during the ensuing three months. In fact, two of the appropriation bills—the District of Columbia Bill and the second deficiency bill—did not finally pass until the last day of session, July 3, 1930. There was considerable wrangling in the conference committees of the House and Senate over appropriation bills. This was most noticeable in the consideration of the District of Columbia Bill during which a protracted dispute arose over the amount of the subvention from the national treasury. The House favored $9,000,000 and the Senate $12,000,000. It seemed for a while that the District would be left stranded. But at the last minute the conference committee agreed on $9,500,000 and the two houses approved.

Tariff Revision.—The Smoot-Hawley tariff bill, carried over from the special session of Congress convened April 15, 1929, and adjourned Nov. 22, was taken up immediately after the opening of the regular session on Dec. 2, and occupied much of the Senate's attention until March 24, 1930, when the bill was ready for conference. It passed the Senate on that day with a total of 1,253 amendments to the original House bill. Numerous conferences followed in which the flexible tariff provision and the farm debentures constituted the principal obstacles to agreement. The conferees finished May 24. After considerable dispute in the Senate and a return of the bill to conference, it was finally brought to a vote June 13, when the conference report was accepted by a vote of 222 to 153 in the House and 44 to 42 in the Senate. The President approved the act, June 17.

Tax Reduction.—Immediately after the opening of the session a joint resolution was introduced in the House calling for a reduction of $160,000,000 in the income taxes payable in 1930 on the earnings of 1929. The House passed this resolution by a vote of 282 to 17, Dec. 5, 1920, in accordance with the administration's suggestion for speedy approval. Owing to debate on amendments in the Senate, the resolution did not reach a vote until Dec. 14, when it passed 63 to 14 without amendment. The President signed it, Dec. 16.

Tax Refunds.—Tax refunds submitted by the Secretary of the Treasury to the House during December, 1929, amounted to over $190,000,000, with an additional interest charge of about $41,000,000, making a total of $231,000,000. Representative Garner of Texas vigorously attacked "this lavish refunding of taxes." He claimed that in eleven years, tax refunds, credits, and abatements had totaled nearly $3,000,000,000, and numerous refunds had been made without court decisions covering many of the issues involved. The Treasury thereupon issued a statement in which it said a resort to the courts on all points involved in tax refunds would result in interminable delay and break down the administration of the income tax system. It pointed out that during the past fourteen years the total amount of additional assessments resulting from office audits and field investigations had been $5,345,000,000 in round figures, while the amount paid out in refunds during the same period had been $1,254,317.890. During that period, it is said that the total internal revenue receipts had been $44,000,000,000 in round figures, so that the amount refunded had been approximately 2.8 per cent of the amount collected.

BUILDING PROGRAM

Roads.—In his message to Congress Dec. 3, 1929, President Hoover urged that a special effort be made "to expand construction work in order to assist in equalizing other deficits in employment." With this encouragement from the President, Congress proceeded to liberalize the Federal aid subsidy for roads. An amendment to the Federal Aid Road Act authorized an additional $50,000,000 for the fiscal year 1931, increased the regular subsidy for the two following years from $75,000,000 to $125,000,000, and raised the maximum contribution on the part of the national Government from $15,000 to $25,000 per mile. An additional $31,400,000 were also made available for use on the roads during the fiscal years ending June 30, 1930.

Waterways.—The first omnibus rivers and harbors bill in several years was enacted. It carried authorizations aggregating approximately $145,000,000. The ultimate cost of projects included in the bill was estimated at about $350,000,000. The most controversial item in this bill related to the national Government taking over the state-owned canals in New York, if the state government approves, and maintaining them at an estimated cost of $2,500,000 a year.

Public Buildings.—The public buildings construction program was also greatly extended, without changing its general character, by an act authorizing appropriations aggregating $230,000,000, about evenly distributed between buildings within and without the District of Columbia. This act and other recent legislation contemplate the appropriation of about $50,000,000 a year for the next ten years for public buildings, or an aggregate of $500,000,000. Numerous minor projects and authorizations bring the total which is to be spent during the next three years up to about $900,000,000.

PRESIDENT'S DEFICIT WARNINGS

As Congress proceeded with the program to stimulate public construction, the Administration on at least two occasions informed that body that it foresaw a deficit in the national treasury. Feb. 24, 1930, the President warned Congress to economize or be faced with a tax rise of 40 per cent. In support of this position, projects before Congress to the amount of $1,735,000,000 were listed, which were said to be in addition to those in the budget. Some congressmen immediately saw a shift in the President's stand on increased public works as a means of avoiding unemployment and business depression. Again on April 22, President Hoover announced that there would be a deficit of $20,000,000 to $30,000,000 for the fiscal year ending June 30, 1931, on the basis of the appropriations already passed. Letters to this effect were sent to Senator Jones and Representative Wood, chairman respectively of the Senate and the House Committees on Appropriations. On the same day the President, through the Budget Bureau, sent to the House an additional request for over $28,000,000 for expenses incident to carrying out the public building program during the fiscal year 1931.

SUMMARY OF APPROPRIATIONS BY CONGRESS

(Short Session, 1930)

Title of Act	Total
Regular Annual Acts	
Agriculture	$155,397,770
District of Columbia	45,776,032
Independent offices	553,523,166
Interior	286,543,423
Legislative	26,557,767
Navy	380,573,111
State, Justice, Commerce, and Labor	114,253,236
State	17,020,469
Justice	31,771,112
Commerce	53,240,485
Labor	12,221,170
Treasury and Post Office	1,149,088,008
Treasury	312,304,931
Post Office	836,783,077
War Department	456,544,151
Military	339,106,459
Non-Military	117,437,692
Total, regular annuals	3,168,256,665

Deficiency Acts	
First, 1930	169,547,689
Second, 1930	74,105,104
Total, deficiency acts	243,652,794
Miscellaneous Acts	
Miscellaneous relief and other acts	43,468,781
Total, regular annual, deficiency, and miscellaneous acts	3,455,378,241
Permanents and Indefinites	
Total, permanent and indefinites	1,417,022,855
Grand total	4,872,401,096
Less sums payable from postal revenues	840,271,353
Total, exclusive of Postal Service, payable from postal revenues	$4,032,129,742

EXECUTION OF THE 1930 BUDGET

Government's Fiscal Condition.—Total revenues for the fiscal year ended June 30, 1930, amounted to $4,177,941,701.99, as compared with $4,033,250,225.05 for the preceding fiscal year. This gain was due to increases of $101,275,641.74 in internal revenue receipts and $58,677,718.12 in miscellaneous receipts, and a decrease of $15,261,882.92 in customs receipts. Total expenditures, exclusive of the postal service, for the fiscal year 1930 were $3,994,152,487.09, as compared with $3,848,463,189.63 for the preceding fiscal year. This increase was due principally to expenditures of $149,958,273.55 in 1930 on account of the agricultural marketing fund, for which there were no expenditures during the previous year; increases of $56,205,804.53 in general expenditures and $15,806,099.94 for the Shipping Board, which were partly offset by reductions of $18,982,786.43 in interest on the public debt, and $54,610,330.87 for refunds of internal revenue and customs receipts. The surplus for the fiscal year 1930 was $183,789,214.90 as compared with $184,787,035.42 for the previous fiscal year. The entire surplus for 1930 was applied to the further reduction of the public debt in addition to the reduction of $388,368,950 through the operation of the sinking fund, $165,514,653.25 from foreign debt repayments and other special fund receipts, and $8,105,834.52 from the net balance of the general fund in the treasury, making a total reduction during the fiscal year 1930 of $745,778,652.67. This left a public debt outstanding on June 30, 1930, of $16,185,305,831.43.

Proposed Economies.—President Hoover started off the fiscal year 1930 by planning reorganization and coördination among the executive bureaus looking toward reductions in operating coasts. He delegated one of his secretaries, Walter H. Newton, to study the problem and prepare a program which he could present to the regular session of Congress in December, 1929. It was estimated that some forty to fifty bureaus and boards doing related work in the several departments could be safely consolidated for better service. Very little, however, was done during the fiscal year 1930 to bring about the proposed changes.

"Business" Meetings and "Economy Clubs".—The semi-annual meetings of the "Business Organization of the Government," which had been established by General Dawes when he was Director of the Budget and carried on regularly under the Coolidge administration, were dropped by President Hoover, apparently never to be revived. The "economy clubs," of which there were some half dozen founded by General Lord while he was Director of the Budget, were also allowed to fall into innocuous desuetude. Perhaps the most famous of these "clubs" was the Woodpecker Club.

Coördination Work.—Director Roop of the Budget Bureau continued the Federal Coördinating Service, practically as it was operating under his predecessor. Chief Coordinator, Rear Admiral H. H. Rousseau, was in charge of the service during the fiscal year 1930 until his death July 24, 1930. In an attempt to strengthen the service, a manual for area coördinators was issued during 1930, as well as a bulletin describing the organization and coördinating duties of the Federal business associations. These associations increased from 280 to 293 with a total membership of approximately 13,000, representing every department and establishment having offices in the field. Specific savings in dollars and cents from the coördinating work were not reported for the fiscal year 1930, as had been the custom theretofore. Not that the savings were any less, so the Budget Director stated, but because they represented at best only a small part of the benefits realized through the coördination work. The function of the Federal Coördinating Service, as it is now called, was again defined as "that of assisting and facilitating such transactions whenever coördinated effort will promote efficient and economical handling of the business of the government."

Budgetary Control.—The Budget Bureau continued the quarterly apportionment of appropriations, so as to keep informed on the obligations against each appropriation, both liquidated and outstanding, the unobligated balances and the amounts set up as reserves. It also initiated a periodic report on the estimated receipts of the government and the cash requirements necessary from time to time to liquidate the government's obligations. This report is made by all the departments and establishments of the government. From the information thus obtained, a balanced statement of estimated receipts and expenditures, showing the estimated surplus or deficit, is prepared monthly and submitted to the President, a copy being furnished to the Secretary of the Treasury. This monthly statement is used in the general control of Federal expenditures and as a guide in connection with the financing of treasury requirements.

PUBLIC DEBT OF THE UNITED STATES

BY FRANCIS H. SISSON

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GROSS DEBT

Reduction and Retirements.—On June 30, 1930 the interest-bearing debt of the United States amounted to $15,921,892,350, the total debt to $16,185,308,299, and the net debt to $15,985,382,828. The latter figure compares with $16,742,764,739 a year earlier, showing a reduction of $757,381,911 during the year. The main sources from which this reduction was effected were the sinking fund, which provided $388,368,950; foreign debt repayments, $160,925,850; and the surplus of Treasury receipts over expenditures, $183,789,215. Further retirements were made during the next quarter. On September 30, 1930, according to the preliminary statement based on the daily Treasury report, the amount of the gross debt less the net balance in the general fund was $15,749,349,408, as against $15,866,702,663 on June 30.

Composition of the Public Debt.—Of the total interest-bearing debt at the end of the fiscal year, $12,111,335,350 was in bonds, $2,390,286,500 in Treasury notes, $1,264,354,500 in Treasury certificates, and $155,916,000 in Treasury bills (maturity value). The bonds were divided into three main categories, namely, pre-war bonds to the amount of $772,544,850, Liberty bonds amounting to $8,201,803,900, and Treasury bonds issued in recent years aggregating $3,136,986,600. Liberty bonds consisted of $1,933,552,350 of the First Liberty Loan and $6,268,251,550 of the Fourth Liberty Loan. All other Liberty bonds had been either redeemed or refunded.

Treasury Surplus.—The amount of debt reduction during the fiscal year was approximately equal to that a year earlier. The Treasury surplus available for that purpose was almost exactly equal to that in 1928-29, and the smaller amount available from foreign debt repayments was offset by the increase in the annual sinking fund instalment.

Interest Rates.—The Treasury

profited by the lower interest rates prevailing during the latter part of the fiscal year. On June 30, the annual rate of interest on the interest-bearing debt was 3.806 per cent, a new low record, as compared with 3.94 per cent at the end of the preceding year. In 1928-29, a slight increase from 3.87 per cent to 3.94 per cent was shown as a result of the higher open market rates that prevailed during that period. The annual interest charge on the debt as of June 30, 1930, was $606,000,000, which compares with interest payments of $678,000,000 in the fiscal year 1929 and $732,000,000 in 1928.

FINANCING THE SHORT TERM DEBT

Treasury Bills on Discount Basis.—The last fiscal year was of special interest in that it marked the introduction of an important new departure in Treasury financing, namely, the use of Treasury bills sold on a discount, rather than an interest, basis. This method of handling the short-term debt has greatly facilitated the task of the Treasury in financing its short-term requirements with the maximum of economy and in avoiding the periodical unsettlement of the money market that formerly accompanied Treasury operations on the quarterly settlement dates.

Financing Methods.—The use of short-term obligations was begun by the Treasury during the war. At that time, the expenditures of the Treasury were, of course, far in excess of revenue receipts, and borrowing on an enormous scale was necessary. Short-term obligations were issued in advance of the Liberty bond flotations, so that the latter became, in part, merely refunding operations. Altogether, loan certificates were issued to the amount of $17,000,000,000 in anticipation of Liberty bond issues totaling $21,400,000,000. The same method was followed in anticipating tax receipts. This method of financing has become a regular feature of Treasury operations in recent years.

Bond Redemption.—The issuance of short-term obligations has also been found extremely useful in connection with the redemption of bonds. The maturities of the Liberty bonds are very irregularly distributed, whereas the sinking fund payments and the other funds for debt retirement become available at a comparatively steady rate. It is the task of the Treasury to re-distribute the maturities of its obligations in such a way as to make them coincide with the dates on which funds become available. In accomplishing this purpose, it is necessary in some cases to issue short-term obligations with maturities on "open dates"—that is, dates when funds will be available for debt retirement but when none of the older issues will become due or callable. Unsettlement in the money market on the quarterly payment dates is avoided by making the maturities of the short-term obligations coincide with income-tax payments. Checks drawn by taxpayers on commercial banks and deposited by the Treasury in the Federal Reserve banks represent money withdrawn from the market. Although Treasury balances might be deposited with the commercial banks instead of with the Federal Reserve banks, thus preventing the disturbing effects of the tax payments, this method would be awkward from the point of view of the Treasury and would probably subject the financial authorities to various kinds of pressure in favor of particular banks or particular localities. The same purpose is accomplished by the redemption of maturing obligations in amounts roughly equivalent to the tax payments. By this means, funds withdrawn from the commercial banks in the form of tax payments are offset by the funds distributed to the commercial banks through redemptions of maturing securities.

Money Market Considerations.—The problem, however, is complicated by the fact that Treasury requirements over the subsequent quarterly period must be provided for. If the amount of incoming tax receipts exactly equalled the amount of maturing obligations, the Treasury would be left without net income. Additional obligations, therefore, must be issued, with the amounts based on the estimated tax receipts and the estimated cash requirements of the Treasury over the ensuing three months. If the newly issued securities were paid for in cash, the effect would naturally be to withdraw funds from the money market and create a temporary stringency. This possibility is avoided by receiving payment for the securities, not in cash, but in the form of deposit credit with the banks purchasing the securities. These deposits, of course, are gradually withdrawn; but, since they are immediately spent by the Treasury and the money is re-deposited in the banks, no disturbance to the money market results.

The Interest Factor.—The principal objection to this method of financing, from the Treasury point of view, is that it involves an interest charge. The two per cent received from the banks as interest on the deposits is not sufficient to offset the coupon rates on the securities. Moreover, the tax payments are usually not received by the Treasury and credited to it on the actual due dates, but several days later. For the interim, the Treasury must borrow from the Federal Reserve banks and must pay interest on such borrowings, in addition to the interest paid on the newly issued securities. Finally, the coupon rates on newly issued securities must be fixed by the Treasury on the basis of its best judgment, not by any fixed criterion of conditions in the money market. In order to overcome these difficulties, the Treasury Department recommended two years ago that legislation be enacted to permit the issuance of non-interest-bearing Treasury bills on a discount basis. This method of financing has been followed in certain foreign countries for many years, but the laws of the United States prohibited the issuance of Government obligations below par. The law permitting this form of security was passed in 1929, and several issues of Treasury bills were floated during the fiscal year 1929-30. Bids are received on a competitive basis, and the securities are awarded to the highest bidders in their order. The principal advantages of this system are that it allows actual conditions in the money market, rather than the judgment of Treasury officials, to determine the interest rates to be paid, and that it allows the security issues to be more closely adjusted, both as to time and amount, to the needs of the Treasury and to the condition of the money market. During the ten months following the first issuance of Treasury bills, six issues were floated at interest rates varying from 1 7/8 to 3.27 per cent. Treasury officials stated that the new form of security had enabled the Government to borrow consistently at the lowest rates and that in all other respects it had amply fulfilled expectations.

STATUS OF THE PUBLIC DEBT

Post-war Phase of Debt Reduction.—The second feature of special interest in the fiscal year 1929-30 was that it marked the close of a decade in Government finance characterized by consistently large debt reductions made possible by heavy Treasury surpluses. The public debt reached its peak in August, 1919, and during the ensuing year it was reduced by a larger amount than in any year since that time. The reduction, however, was made possible principally by a non-recurrent item—the lowering of the Treasury balance from a war-time to a peace-time basis. On June 30, 1920, the interest-bearing debt amounted to $24,061,000,000. During the next ten years, the debt was reduced to $15,922,000,000, or by more than $8,100,000,000. Of this total reduction, by far the greater part has come from three sources: sinking fund, foreign repayments, and Treasury surplus. The latter has accounted for the largest figure, aggregating $3,247,037,377, while the sinking fund has provided $3,187,468,300 and foreign repayments have contributed $1,416,050,550.

Outlook for Debt Retirement.—In view of the progressive reduction of tax rates and of the lower scale of individual and corporate incomes due to the business depression, some doubt has arisen as to the ability of the Treasury to maintain the rate of debt retirement that has been shown during the last decade. Reports for the early months of the fiscal year 1930-31 indicate a sharply reduced Treasury income. How long this condition will last is, of course, problematical, but it should be borne in mind that the policy of the Treasury is to maintain as close a balance between receipts and expenditures as is consistent with safety. If the early indications of a heavily impaired volume of Treasury receipts for the current fiscal year are borne out, the effects may show in the total debt retirement, not only through a smaller reduction from the Treasury balance, but also in the item of foreign repayments. The law sets aside for debt retirement only repayments of principal of foreign loans made under the Liberty Loan Acts. In recent years, both principal and interest payments from foreign governments have been devoted to public debt retirement, Whether or not this policy is followed in the future will presumably depend on the state of the Treasury balance.

Prospects for War Debt Liquidation.—On the whole, it seems probable that debt retirements from the Treasury surplus in future years will be much smaller than in the recent past. Although total receipts from foreign governments will increase, the amounts that can be used for reduction of the public debt are highly uncertain and may well be smaller than in recent years. The amounts of the sinking fund instalments, while they depend to some extent on bond prices and interest rates, are fairly definite and are gradually increasing. The opinion of Treasury officials, based on past experience, future prospects, and present policy, is that the entire war debt may reasonably be expected to be liquidated by 1949. This estimate assumes a future rate of reduction very nearly as large as that maintained during the last ten years.

INTER-ALLIED DEBTS

Total Indebtedness and Payments.—At the end of the last fiscal year, the total indebtedness of foreign governments to the United States amounted to $11,636,776,639.87, as against $11,829,755,777.51 on Nov. 15, 1929, the date of the last annual report of the Secretary of the Treasury The net principal amount of the funded debts was $11,280,200,878.50, with accrued interest thereon of $34,206,294.13, while the unfunded indebtedness amounted to $204,851,842.85, with accrued interest of $117,519,624.39. Total payments received on account of the debts up to that time amounted to $2,391,548,141.97, as against $2,162,605,203.58 on Nov. 15, 1929.

Funding Arrangements.—Little or no progress was made up to 1922 in arriving at a precedent for the terms and method of payment of these obligations to the United States. On Feb. 9, 1922, the World War Foreign Debt Commission was established for the purpose of refunding or converting these foreign obligations. In Nov., 1922, the principal amount of these obligations totaled $10,102,000,000, representing for the most part loans made by the Secretary of the Treasury under the Liberty Loan Acts; more than half a billion was on account of sales of surplus war materials under the act of July 9, 1918, and approximately $84,000,000 was on account of relief supplies furnished under the act of Feb. 25, 1919. In addition to the above amount, the United States Grain Corporation, owned by this country, held obligations of various foreign countries amounting to $56,858,802 on account of shipments of flour for relief purposes, while the War Department and the United States Shipping Board held obligations of the Polish Government amounting to $24,000,000.

Great Britain was the first of our debtors to realize the necessity and desirability of refunding its debt. The British-American debt agreement was signed Jan. 19, 1923, and was approved by this country the following month. This settlement was important in that it was the first and thereby set a precedent that was to be followed in all future funding negotiations. In regard to interest rates and the amount of each payment, no formula could be worked out in the British settlement that could be made applicable to all the debtor countries, and therefore no definite form was worked out. To a very large extent, however, the main features of the British agreement have been incorporated in all the subsequent funding agreements, among the most important of which are: the term of the debt is to run over a period of 62 years; payment of interest and principal may be made either in cash or in United States Government bonds; it is the debtor country's privilege to postpone an individual payment during the first five years for a given period; it is specifically stipulated that this lapsed payment must be paid before any further delays are granted; the principal is to be paid in full, and the funding must take the form of the delivery of bonds of the debtor nation to this Government in a form suitable for marketing to the people of the United States. A great deal of controversy has arisen over this last point, for the debtor nations were at first hostile to the idea that, at any time in the future at the discretion of our Government, they might become debtors to the American people rather than to the United States Government. While this country reserves the right so to dispose of these bonds, assurance has been given by the Treasury Department that such a step is very unlikely.

Belgium.—The settlement with Belgium presented a problem that was not encountered in the negotiations with Great Britain. The war had left Belgium in a difficult position; the economic losses of that country during the conflict have been estimated at $2,000,000,000. After consideration of Belgium's ability to pay her obligations, settlement was accomplished by classifying her debts into two sections; namely, those that had been constracted before the armistice and those assumed at a late date. That portion of the debt in the former classification was given preferential treatment, with interest payments completely canceled, while that in the latter group was funded along the lines of the British-American agreement. However, in negotiations with Belgium, the United States adhered to the fundamental principle that any concessions granted to any debtor nation must take other forms than that of a reduction in the principal amount of the obligation.

Italy.—The doctrine of the ability to pay was further qualified in negotiations with Italy. The low standard of living and the lack of natural resources in that country greatly restricted its ability to pay, especially since Italy was obligated to England for an amount larger than to this country. The greatest concession made to Italy was a suspension of interest rates for the first five years, with a rate of 1/8 of 1 per cent during the following ten years and a gradual increase throughout the life of the funding agreement until the rate of two per cent is reached during the last seven years.

France, whose debt to us is second in magnitude only to that of Great Britain, presented us with perhaps the most difficult negotiations. From the beginning, France insisted that the United States recognize the principle that it could not be expected to make payments beyond that point where its economic structure was threatened with disaster and that any failure of Germany to live up to the reparations agreement would lessen the ability of France to meet its obligations by just that amount of money. During the negotiations of the Experts Committee on Reparations last year, France unsuccessfully continued efforts to condition the payment of its debts to America on Germany's fulfillment of the terms of the Young plan for reparations payments. The Mellon-Berenger debt agreement, which had been in force for a few years preceding its acceptance by the legislative bodies of both countries last year, provides for the payment of $4,025,000,000 over a 62-year period. The first two payments amounted to $30,000,000, with gradual increases until the maximum payment of $125,000,000 is reached in 1942. Payments are to continue at that rate until 1987. Interest is to be paid for 57 years; 1 per cent for the first ten years, 2½ per cent for the following eight years, 3 per cent for the next seven years and 3½ per cent for the remaining twenty-two years.

STATUS OF FOREIGN DEBTS TO THE UNITED STATES

	Amount of obligations originally received	Total principal of bonds received or to be received under funding agreements	Present values of funded debts as of dates of funding on basis of interest rate of 4¼ per cent per annum, and percentage that present value bears to debt prior to funding.*		Total indebtedness outstanding	Total payments to date
			Present value	*Per cent*		
Armenia	$ 11,959,917.49	....	....	....	$ 18,421,141.34	....
Austria	24,055,708.92	$ 24,614,885.00	**	....	24,039,773.00	$ 575,112.00
Belgium	379,087,200.43	417,780,000.00	$ 225,000,000.00	46.5	404,730,000.00	44,891,273.24
Cuba	10,000,000.00	....	....	....	....	12,286,751.58
Czechoslovakia	91,879,671.03	185,071,023.07	91,964,000.00	74.3	170,071,023.07	15,304,178.09
Estonia	13,999,145.60	13,830,000.00	11,392,000.00	80.5	16,375,440.32	851,441.88
Finland	8,281,926.17	9,000,000.00	7,413,000.00	80.7	8,659,000.00	2,640,740.27
France	3,404,818,945.01	4,025,000,000.00	1,996,509,000.00	47.2	3,865,000,000.00	446,075,891.00
Great Britain	4,277,000,000.00	4,600,000,000.00	3,788,470,000.00	80.3	4,426,000,000.00	1,751,438,298.67
Greece	27,167,000.00	32,497,000.00	***	....	31,970,000.00	2,171,736.01
Hungary	1,685,835.61	1,982,555.50	1,596,000.00	80.4	1,920,315.00	399,278.19
Italy	1,648,034,050.90	2,042,000,000.00	528,192,000.00	24.6	2,017,000,000.00	82,963,171.90
Latvia	5,132,287.14	5,775,000.00	4,755,000.00	80.7	6,838,127.75	480,828.95
Liberia	26,000.00	....	....	....	....	36,471.56
Lithuania	4,981,628.03	6,432,465.00	4,967,000.00	79.9	6,235,207.00	903,999.01
Nicaragua	431,849.14	....	....	....	320,627.99	168,783.13
Poland	159,666,972.39	178,560,000.00	146,825,000.00	80.5	209,157,726.06	15,185,590.17
Rumania	37,922,675.42	66,560,560.43	35,172,000.00	74.9	64,560,560.43	4,061,945.76
Russia	192,601,297.37	....	....	....	303,629,697.91	8,748,878.87
Yugoslavia	51,758,486.55	62,850,000.00	20,030,000.00	30.3	61,850,000.00	2,363,771.69
Total	$10,350.490,597.20	$11,671,953.489.00	$6,862,285,000.00	57.0	$11,636,778,639.87	$2,391,548,141.97

* Interest rates on foreign obligations prior to funding ranged from 3 to 5 per cent.
** Time of payment of principal and interest extended to June 1, 1943.
*** New loan made at time of funding agreement.

Other Debtor Nations.—Agreements along similar lines were made with the several other debtor countries, and an idea of the status of the debts, as of July 1, 1930, may be gained from the accompanying table. Practically all of the settlements represent a more or less liberal interest policy. In the agreement with Greece which was completed last year, no mention of interest rates whatever was made, while an additional loan of $12,167,000 was granted to that country at an interest rate of 4 per cent. At the completion of the fiscal year ended July 1, 1930, of the twenty countries to which this country made advances on account of the war financing, funding agreements had been completed with fifteen. Of the remaining five, Cuba and Liberia have paid off their obligations; Nicaragua has made substantial headway in wiping out its obligation without any funding agreement, while Russia and Armenia have no governments recognized by the United States.

Conclusions.—Inasmuch as negotiations with debtor nations have progressed considerably since 1922 and all possible funding agreements have now been made, the Inter-Allied debts, in so far as the mechanics of their payment is concerned, have become a less prominent subject in the last few years. The report of the United States Treasury for the fiscal year ended July 1, 1929, confined its remarks on this subject mostly to a report of the successful final settlements with France and Greece. What developments may take place in the future regarding changes in the terms now in force is difficult to say. In the annual reports of the Treasury Department, the Secretary of the Treasury has from time to time expressed viewpoints that strongly suggest a discouragement of the idea that these debts would either be reduced or repudiated in the future. It was brought out that the United States had already been very liberal in its agreements with the debtor nations, considering the ability to pay in each case and the difference in the value of the dollar at the time the loan was made; that the assumption is reasonable that the war debts are owed essentially to the American people, and that the American taxpayers must make up every dollar that is not paid; and that besides, in the interest of the sanctity of international obligation, these debts should be paid, since otherwise the foundation for any similar international borrowing in the future would be seriously weakened. He strongly discouraged the repudiation of these debts.

STATE FINANCE

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EXPENDITURES

The Trend.—Continued emphasis on entrenchment in public expenditures seems to have little effect upon the trend of expenditures of the states. Increase in state expenditure has been more rapid than that of the Federal Government and of cities, although as a total the expenditure is less than either. Expenditures of the states reaches between 15 and 20 per cent of those of all governmental bodies.

Items.—The Bureau of the Census divides operation and maintenance charges into a number of items, the most important of which are general government, protection of person and property, development and conservation of natural resources, health and sanitation, highways, charities, hospitals and corrections, schools, libraries, and recreation. These items have not from year to year occupied a place of the same relative importance. The recent emphasis upon highway construction has increased the importance of highway expenditures. In some states the expenditure for highways exceeds that for any other item.

EXPENDITURES OF STATES FOR SPECIFIED ITEMS

(000 omitted)

Year	General Government			Protection to Person and Property			Development and Conversation of Natural Resources			Health and Sanitation		
	Total	Per capita	% of total	Total	Per capita	% of total	Total	Per capita	% of total	Total	Per capita	% of total
1927....	$99,759	$0.85	8.9	$63,770	$0.55	5.7	$64,599	$0.55	5.8	$27,825	$0.24	2.5
1926....	86,870	0.75	8.4	59,747	0.52	5.8	62,696	0.54	6.0	25,549	0.22	2.4
1924....	74,583	0.67	7.4	50,998	0.46	5.1	53,189	0.48	5.3	23,057	0.21	2.3
1922....	71,288	0.66	7.8	52,738	0.49	5.7	42,021	0.39	4.6	21,996	0.20	2.4
1919....	52,152	0.50	9.6	34,102	0.33	6.3	24,360	0.23	4.5	14,404	0.14	2.7
1917....	45,414	0.45	10.7	30,298	0.30	7.1	18,999	0.19	4.5	11,257	0.11	2.6
1915....	44,508	0.45	11.7	26,295	0.27	6.9	16,559	0.17	4.4	9,454	0.10	2.4

Year	Highways			Charities, Hospitals and Corrections			Schools			Recreation		
	Total	Per capita	% of total	Total	Per capita	% of total	Total	Per capita	% of total	Total	Per capita	% of total
1927....	$170,793	$1.46	15.2	$193,225	$1.65	17.3	444,883	$3.79	39.7	$4,039	$0.03	0.4
1926....	156,639	1.35	15.1	178,580	1.54	17.2	413,074	3.57	39.7	3,542	0.03	0.3
1924....	123,308	1.11	12.3	165,216	1.49	16.5	368,908	3.32	36.8	2,517	0.02	0.3
1922....	106,337	0.98	11.6	162,469	1.50	17.7	329,863	3.05	35.9	1,870	0.02	0.2
1919....	61,628	0.59	11.4	134,056	1.28	24.7	183,200	1.74	33.8	1,212	0.01	0.2
1917....	33,631	0.33	7.9	103,434	1.02	24.3	160,086	1.57	37.5	1,091	0.01	0.3
1915....	22,768	0.23	6.0	89,189	0.91	23.5	145,832	1.48	38.5	879	0.01	0.2

*INCREASE IN STATE EXPENDITURES

(000 omitted)

Year	Total Amount	Total % increase over 1915	Operation & Maintenance Amount	Operation & Maintenance % increase over 1915	Interest Amount	Interest % increase over 1915	Outlays Amount	Outlays % increase over 1915
1927....	$1,726,989	249	$1,129,480	196.3	$78,722	324.5	$518,788	455
1926....	1,614,538	226.2	1,049,311	174.3	76,869	314.5	488,358	413
1924....	1,513,628	205.8	1,012,504	165.6	55,848	201.1	445,276	367.8
1922....	1,280,320	158.7	920,967	141.6	41,308	122.7	318,045	234.1
1919....	640,403	29.4	545,178	43.0	24,079	29.8	71,145	25.3
1917....	517,503	4.6	428,439	12.4	21,153	14.1	67,911	28.7
1915....	494,907	.....	381,168	.....	18,546	.....	95,193	.....

* Compiled from *Financial Statistics of States*, 1927.

Education.—The large increase in enrollment in public educational institutions has meant a rapid increase in costs. Of the total expenditure for education, however, about sixty-five per cent is appropriated to minor divisions, as counties, cities, or townships. In some states the amount so appropriated is large, while in other no funds are so used. This helps to account for the lack of uniformity in the expenditure for education among the different states.

Charities.—The item for charities, hospitals and corrections is the most discouraging of all state expenditures. The number of these "human culls" seems to be increasing more rapidly than adequate provision can be made even with the large increase in expenditures. One reason for the large expenditure by state is that few institutions for these classes are provided by the other political units. The principal items under charities are poor in institutions, care of children, and care of blind, deaf, and mute; under hospitals, general, insane and feeble-minded; and under corrections institutions for adults and minors.

Natural Resources.—The item of development and conservation of natural resources is one of increasing importance. Under this is placed such activities as extension service, experiment stations, agricultural associations, livestock, reclamation, forestry, fish and game, and geological survey.

Health.—The expenditures for conservation of health and sanitation deal with vital statistics, prevention of tuberculosis and other diseases, conservation of child life, food regulation and inspection and regulation of profesional occupations. While the total expenditure for protection is not large it is made for such items as regulation of the sale of oil and gas, of weights and measures, of immigration, the inspection of labor in mines and factories, and protection through the fire warden and prohibition enforcement.

REVENUE

Sources.—The increase in state expenditures has meant an increase in revenues. These have been furnished by relying more heavily upon sources already in use and by inaugurating new sources. According to the report of the Bureau of the Census, *Financial Statistics of States*, the total revenue receipts for the states for 1927 were $1,758,381,000, distributed as follows:

REVENUE RECEIPTS OF STATES, 1927

(000 omitted)

General property taxes..........	$370,435	Fines, forfeits and escheats....	$ 7,912
Special property taxes..........	301,943	Subventions and grants.........	138,770
Poll taxes	3,426	Highway privileges	81,922
Business and non-business taxes.	697,324	Earnings of general departments.	134,881
Special assessments	27,078	Earnings of public service enterprises	12,692

PER CAPITA RECEIPTS FROM DIFFERENT SOURCES

Year	General Property		Special Property		Business and non-business license		Poll		Earnings of general depts.		Sub-ventions, grants, etc.		Other	
	Per capita	%	Per capita	%	Per capita	%	Per capita	%	Per capita	%	Per capita	%	Per capita	%
1927....	$3.16	21.1	$2.57	17.2	$5.79	38.6	$0.03	0.2	$1.15	7.7	$1.18	7.9	$1.11	7.3
1926....	3.24	22.7	2.32	16.2	5.32	37.2	0.03	0.3	1.12	7.8	1.20	8.4	1.05	7.5
1924....	3.16	25.7	2.04	16.6	3.91	31.8	0.03	0.3	1.02	8.3	1.20	9.8	0.94	7.7
1922....	3.22	30.0	1.81	16.9	2.82	26.3	0.08	0.7	1.08	10.1	1.02	9.5	0.69	6.3
1919....	2.26	35.1	1.17	18.2	1.57	24.5	0.02	0.3	0.79	12.3	0.16	2.5	0.45	7.0
1917....	1.80	34.9	1.08	21.2	1.12	21.9	0.02	0.4	0.61	12.0	0.11	2.1	0.39	7.5
1915....	1.89	40.6	0.84	18.2	0.95	20.3	0.03	0.7	0.51	11.0	0.08	1.6	0.35	7.6

Classification of State Revenues.—These tables indicate that the general property tax, long the bulwark of state revenue, continues to lose favor. The situation, however, is that certain states have given up property as a source of revenue, while others still rely extensively upon it. In 1927 Pennsylvania and North Carolina reported no receipts from the general property tax; California reported only receipts from levies of prior years while the only use made of the general property tax by Delaware was for schools. New York continues to tax property only for a few specific purposes while Wisconsin has withdrawn real and personal property as a base for state taxes. Receipts from special property taxes were reported by thirty-two states. More than 77 per cent of these were in Massachusetts, New York, Pennsylvania, Ohio, Michigan and California. Inheritance taxes made a part of these in 45 states and income taxes in 12 states. Other special taxes were incorporation or organization taxes, stock transfer taxes and taxes upon certain classes of public utilities. Poll taxes are of less importance than shortly after the War when they were used by some states to provide funds for a soldiers' bonus. In 1927 11 states reported receipts from poll taxes. One of the most important items under business taxes is the tax upon motor fuel, now found in every state. The most important source of revenue from licenses is the levy upon motor vehicles.

LEGISLATION AND CONSTITUTIONAL AMENDMENTS

Since most state legislatures meet only in odd years there has been comparatively little legislation during 1930. Only nine states were in regular session, although in some states special sessions were called for particular purposes. The states in regular session were Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina and Virginia. Those which held special sessions were Idaho, Illinois, Kansas, Maine, Maryland, Nebraska, New Hampshire, Texas, Utah and West Virginia. State constitutions in many instances are still unsatisfactory in respect to the revenue provisions. In the November, 1930, election at least thirteen states voted on Constitutional amendments. Most of these were designed to liberalize the constitution so as to give the legislature more power in framing revenue legislation.

GASOLINE AND MOTOR VEHICLE TAX

Gasoline Tax Increase.—The tax on gasoline has had a more rapid adoption than any form of taxes used by the states. The tax seems to have reached a considerable degree of stability since not many changes have been made, or seem to be contemplated. The changes in the past year have been that the rate has been increased from four to five cents a gallon in Idaho and Louisiana. New Jersey voted on a bond issue of $100,000,000, which carried the tax on gasoline automatically from two to three cents. In Pennsylvania the tax automatically fell from four to three cents. Some tendency was shown to inaugurate the deposit of bonds by dealers in gasoline. The amount of the tax on gasoline in the different states in 1930 is shown in the following table:

State	*Cents*
Alabama	4
Arizona	4
Arkansas	6
California	3
Colorado	4
Connecticut	2
Delaware	3
Florida	5
Georgia	4
Idaho	5
Illinois	3
Indiana	4
Iowa	3
Kansas	3
Kentucky	3
Louisiana	5
Maine	4
Maryland	4
Massachusetts	2
Michigan	3
Minnesota	3
Mississippi	2
Missouri	2
Montana	5
Nebraska	4
Nevada	4
New Hampshire	4
New Jersey	2
New Mexico	5
New York	2
North Carolina	5
North Dakota	2
Ohio	4
Oklahoma	3
Oregon	3
Pennsylvania	3
Rhode Island	2
South Carolina	6
South Dakota	3
Tennessee	5
Texas	3
Utah	3½
Vermont	4
Virginia	5
Washington	2
West Virginia	4
Wisconsin	3
Wyoming	4

Distribution of Receipts.—One of the problems of gasoline taxation concerning which there is still a difference of opinion is the distribution of the receipts. Some contend that the entire receipts should be used for highway construction and maintenance while others contend that a part may rightly be used for other purposes. There is some evidence that the latter position is gaining in favor. In Michigan, Idaho and Pennsylvania a part of the receipts is allocated to the development of air transportation. In Florida, Georgia, and Texas a small part goes to the support of education while in South Dakota a part is placed in the general fund. In some states, as in Kansas, the cities are allowed to levy an additional tax for the use of the city, while in some states the cities are clamoring for a share of the receipts from the state tax. The Illinois Municipal League favors a distribution of one cent of the three collected to cities for municipal use.

Motor Vehicle Tax.—The taxation of motor vehicles is still unsatisfactory. The complex problems arising because of the different types of vehicles—private automobiles, buses operated for hire, trucks operated as parts of a private business as well as for hire either on a contract or commercial basis—have not been solved. Few changes were made during the current year. Kentucky decreased its registration fees by 25 per cent while Virginia levied a tax of ½ of 1 per cent upon the gross receipts of motor passenger and property carriers. The National Tax Association has a standing committee for the study of the taxation of motor vehicles. Three valuable reports have been made. The report made at the Conference held at Kansas City in October, 1930, placed special emphasis on the use of a gasoline tax. The committee has been continued to make further study into the problem of motor vehicle taxation. Some attention has been given to the regulation of rates and services of commercial motor carriers but as yet nothing of a satisfactory nature has been accomplished. The fact that many such carriers now transact an interstate business complicates the problem and involves the Federal Government in the problem.

TAXES ON COMMODITIES

In recent years there has been a marked tendency for states to levy taxes on commodities. South Carolina has included many articles of luxury in this tax and has recently further extended its use by reducing the base for the tax on candy from 80 cents a pound to 50 cents. Mississippi recently enacted a tobacco tax, the rate being 1 cent for each 5 cents of the retail price of cigarettes, and 20 per cent of the retail price of cigars. Michigan and New Mexico have both passed tobacco tax legislation, subject, however, to the results of a referendum, Mississippi also levies an admision tax of 1 cent for each 10 cents of admission price to all places of amusement. In Tennessee the tax on tobacco has been changed to 10 per cent of the retail price of cigars, manufacturers' tobacco and snuff, and to 1/5 of 1 cent for each cigarette unless the selling price is more than 1 cent, in which case the tax shall be 20 per cent of the selling price. The tax on malt is still popular, although some recent changes may be noted. In Louisiana the rate was lowered from 10 cents a pound to 3 cents. In South Carolina a tax of 10 cents a pound was recently levied upon all malt or malt extracts or substitutes.

THE SALES TAX

A great deal of interest centers around the sales tax. In its broadest sense a sales tax refers to a levy upon the gross selling price of all commodities and services, whether they be final or intermediary sales. Such an inclusive tax is rarely found, however, and in practice many modifications are made. Some form of sales tax had a wide acceptance in European countries as an emergency measure following the war, while the evidence indicates that many of the American states are not looking upon it with disfavor. West Virginia has been experimenting with a so-called general sales tax for several years. Delaware and Connecticut use a merchants' and manufacturers' tax while Pennsylvania has used a mercantile tax for many years. Within the year there is evidence of an extended use of the tax. Georgia levied a general sales tax estimated to yield $2,000,000. Mississippi and Kentucky have both levied sales taxes. The rates depend upon the nature of the business and range from one-tenth of 1 per cent to 1 per cent. The exemption of $5,000 and the deduction of all privilege taxes shows how far the levy fails to be a general sales tax. In Kentucky the sales tax rate varies not with the kind of business, but with the amount. The rate ranges from one-twentieth of 1 per cent of sales up to $400,000 to 1 per cent of sales over $1,000,000. The legislation was directed primarily at chain stores but with the purpose of satisfying the courts, was made general in character. Many other states have attempted to levy taxes which will specifically hit chain stores, but just how far such will stand the scrutiny of the courts has not definitely been determined.

BANK AND FRANCHISE TAXES

No tax is in such a state of flux and uncertainity as that upon banks. The hope from the modified Section 5219 following the Richmond decision of 1921 was shattered by the recent Macallen case. Following its lead, the law by which banks were taxed in Washington was declared unconstitutional. In Oregon the money collected is being held by the state treasurer until the constitutionality of the law is decided. The Michigan law has been declared unconstitutional while Kansas bankers have been requested not to start litigation until possible modification of Section 5219. These but illustrate the situation, the chaos of which should result in further modification of Section 5219. Few recent changes have been made in the franchise tax upon corporations. A new law was passed in Texas to supplant the old, which had been declared unconstitutional. Mississippi levied a tax upon all corporations organized for profit, while Tennessee gives her corporations an option of paying a tax of ½ of 1 per cent of gross receipts with a minimum of $25 instead of the former tax on capital stock.

DEATH DUTIES AND INCOME TAXES

Changes in inheritance and estate taxes have not been as frequent as in previous years although the change in the New York law was drastic and may be the forerunner of similar changes in other states. The inheritance tax and estate tax, both of which have been in use simultaneously, were repealed and a new estate tax, based upon the Federal estate tax, was substituted. The rates range from four-fifths of 1 per cent to 16 per cent. No estate of less than $5,000 is taxable, while an exemption of $20,000 is allowed for husband or wife, and $5,000 for ancestors or descendents. In order to secure advantage of 80 per cent credit allowance of the Federal Government, Kansas increased her inheritance tax rates equal to the difference between the existing rates and those necessary to receive full benefit of Federal credit.

Every year sees some form of income tax more strongly entrenched as a source of state revenue. Recent developments have established the constitutionality of the new Georgia income tax. South Carolina increased the rates on corporate incomes from 4 per cent to 4½ per cent, and also lowered the brackets for the personal income tax. The exemptions are now $1,200, decreased from $1,500, for a single person, and $2,200, decreased from $2,500, for the head of a family. Under the law rates now range from 1 per cent on incomes from $1200 to $2,000 to 5 per cent on all incomes over $8,000. The state has gone on record as the first to enact a reciprocal provision for non-residents deriving income in South Carolina. Virginia, on the other hand, increased exemptions from $1,000 to $1,250 for a single individual, and from $2,000 to $2,800 for the head of a family.

PERMANENT AND SPECIAL TAX COMMISSIONS

Most states have permanent tax commissions. At their inception most of these commissions were largely administrative in nature, but each year finds them giving more attention to needed changes to the end that tax systems may be more just and workable. Many of the regular reports are no longer merely a collection of statistical tables as a record of the administrative activities, but contain the findings of the research carried into different problems together with recommendations for change. The New York commission is one of the most active in research projects, having recently been responsible for the publication of an outline of the tax systems of the Federal Government as well as that of most of the states. The fact that it provides scholarships in several universities to graduate students to carry on research in taxation is evidence of its interest in the study of tax problems.

A great deal of study into the problems of taxation has been carried on by special investigating commissions. Some of those which were appointed in 1929 have made reports which are a valuable part of the current literature on taxation. Seventeen special commissions were appointed in 1930. The work of many of these investigating bodies extends beyond the study of taxation into the fields of expenditure and administration of funds. Considerable difficulty is encountered because of the lack of adequate records and the absence of satisfactory accounting and budgetary methods. If these studies now in progress are made with thoroughness, the information disclosed should be of value in the movement for better systems of state and local taxation.

STATE BUDGETS AND ADMINISTRATION

Less attention has been given to the proper administration of public funds than to the reform in taxation, largely because taxes are the most evident part of a revenue system and that part in which there is most public interest. While little emphasis has been placed upon administrative changes, each year sees some advance in more effective budgeting, and accounting procedure. The findings of many of the special investigating committees will undoubtedly cause increased attention to be given to proper administrative procedure.

VII. PUBLIC FINANCE AND TAXATION

CITY FINANCE

By Merlin H. Hunter
Professor, University of Illinois

TRENDS OF EXPENDITURES

Increase.—Much has been said and written in recent years concerning the tremendous increase in public expenditures. This may be explained from the facts that people are demanding many more governmental services, that they are demanding services of a higher quality, and that the dollar of the government will not purchase as much as formerly. The increase in municipal expenditures for cities of more than 30,000 population is shown in the following table:

MUNICIPAL EXPENDITURES

(000 omitted)

Year	Total	General government	Protection to person and property	Health and sanitation	Highways
1927	$1,562,615	$136,848	$315,362	$160,259	$137,892
1926	1,464,849	128,365	295,256	148,658	132,321
1924	1,287,484	111,856	259,275	130,388	109,807
1922	1,155,691	105,174	234,199	115,448	98,763
1919	697,319	72,585	146,763	78,847	65,003

Year	Charities, hospitals, and corrections	Schools	Libraries	Recreation	Miscellaneous
1927	$ 99,806	$560,668	$ 20,167	$ 53,839	$ 77,771
1926	89,987	528,986	18,665	50,427	72,180
1924	79,239	475,725	15,782	41,819	63,590
1922	76,627	422,843	14,326	38,703	49,603
1919	53,262	216,701	9,079	24,204	33,870
1917	43,911	180,259	7,570	20,636	22,164
1915	38,285	162,332	7,134	20,416	18,535
1913	32,702	141,453	6,379	18,555	21,125
1911	30,647	127,604	5,939	17,114	13,801
1909	28,133	114,381	6,242	14,076	11,480
1907	24,408	102,395	4,989	11,794	13,572
1905	19,319	87,600	4,153	10,201	9,728
1903	18,280	80,853	4,067	7,457	5,634

Relation of Expenditures to Growth in Population.—One's first impression upon observing the tremendous growth in public expenditures is that a tremendously increased burden has been placed upon the people. This is not necessarily true. If the population has been increasing more rapidly than the expenditures, then the amount which falls to each individual has actually decreased. More important still is the relation of the increase in social income to the expenditure; if this has been increasing more rapidly than the expenditure, then each year the individual is giving up a smaller percentage of the income. In fact, the per capita cost of municipal expenditures has been increasing, especially in recent years.

PER CAPITA COST OF MUNICIPAL EXPENDITURES

Year	Total	General government	Protection to person and property	Health and sanitation	Highways	Charities, hospitals, and corrections	Education		Recreation	Miscellaneous
							Schools	Libraries		
1927.....	$40.77	$3.46	$8.13	$4.13	$3.60	$2.49	$15.08	$0.53	$1.40	$1.94
1926.....	38.99	3.32	7.77	3.90	3.55	2.29	14.49	0.50	1.34	1.83
1924.....	35.61	3.01	7.10	3.55	3.07	2.08	13.52	0.44	1.15	1.67
1922.....	33.15	2.94	6.66	3.25	2.87	2.08	12.50	0.41	1.09	1.34
1919.....	21.63	2.22	4.53	2.34	2.04	1.59	6.88	0.28	0.74	1.01
1917.....	18.96	2.18	4.04	1.93	1.96	1.36	5.89	0.25	0.66	0.69
1915.....	18.45	2.10	4.06	1.86	2.06	1.26	5.58	0.24	0.68	0.61
1913.....	17.23	2.00	3.89	1.75	1.93	1.11	4.98	0.22	0.63	0.71
1911.....	17.62	2.08	4.12	1.77	2.04	1.17	5.04	0.23	0.65	0.53
1909.....	16.07	1.96	3.89	1.62	1.71	1.10	4.54	0.25	0.55	0.45
1907.....	15.95	1.86	3.80	1.59	1.91	1.05	4.42	0.21	0.51	0.59
1905.....	13.88	1.38	3.52	1.35	1.67	0.88	3.99	0.19	0.47	0.44
1903.....	13.19	1.46	3.35	1.21	1.64	0.86	3.86	0.19	0.35	0.27

Relative Importance of Expenditures.—In all cities for many years the expenditure which has ranked first in size has been that for education. This expenditure, however, as well as many of the others, have not always had the same relative emphasis, in that the percentage of the total used therefor has varied.

PERCENTAGE OF MUNICIPAL EXPENDITURES FOR DIFFERENT ITEMS

Year	General government	Protection to person and property	Health and sanitation	Highways	Charities, hospitals, and corrections	Education		Recreation	Miscellaneous
						Schools	Libraries		
1927.......	8.5	20.0	10.1	8.8	6.1	37.0	1.3	3.4	4.8
1926.......	8.5	19.9	10.0	9.1	5.9	37.2	1.3	3.4	4.7
1924.......	8.5	19.9	10.0	8.6	5.9	38.0	1.2	3.2	4.7
1922.......	8.9	20.1	9.8	8.7	6.3	37.7	1.2	3.3	4.0
1919.......	10.2	21.0	10.8	9.4	7.3	31.8	1.3	3.4	4.7
1917.......	11.5	21.4	10.1	10.4	7.2	31.1	1.3	3.5	3.5
1915.......	11.4	22.0	10.1	11.2	6.8	30.2	1.3	3.7	3.3
1913.......	11.6	22.6	10.1	11.2	6.4	28.9	1.3	3.7	4.2
1911.......	11.8	23.4	10.1	11.6	6.6	28.6	1.3	3.7	3.0
1909.......	12.2	24.2	10.0	10.6	6.9	28.2	1.5	3.4	2.8
1907.......	11.7	23.8	9.9	12.0	6.6	27.7	1.3	3.2	3.6
1905.......	10.0	25.3	9.7	12.0	6.3	28.7	1.4	3.4	3.2
1903.......	11.1	25.3	9.2	12.4	6.5	29.3	1.5	2.7	2.1

Analysis of Municipal Expenditures.—The Bureau of the Census divides the governmental costs into the three items of expense, interest and outlays. Under expenses are placed the payments for operation and maintenance and all the costs and losses of cities from which no permanent or subsequently convertible value is received or receivable. They are costs, exclusive of those arising from the construction or acquisition of permanent properties or improvements which are incurred on account of services employed, property rented, and materials utilized in connection with the maintenance and operation of government. In addition, expenditures include interest and outlays. The former is self-explanatory and amounted in 1927 to a total of $319,248,702. Outlays represent the cost of land and other properties and improvements more or less permanent in character which are owned and used by municipalities in the exercise of their municipal functions or in connection with the business undertakings conducted by them. These include all payments for the purchase and improvement of land, the erection of buildings, the installation and extension of water systems, electric light systems, the purchase of fire fighting equipment, for libraries, museums and art galleries, and payments for all other acquisitions which add to the permanent possessions of the municipality. The expenditure for outlays in 1927 was $1,091,959,616.

PER CENT EXPENDITURE FOR DIFFERENT ITEMS

Year	Operation and maintenance	Interest	Outlays
1927	59.0	8.1	32.9
1926	60.4	8.2	31.4
1924	61.2	7.9	30.9
1922	62.9	9.8	27.3
1919	68.0	10.9	21.1
1917	62.9	11.0	26.1
1915	58.9	10.4	30.7
1913	58.6	9.7	31.7
1911	56.3	9.5	34.2
1909	57.0	9.4	33.6
1907	56.9	8.5	34.6
1905	58.2	9.2	32.6
1903	58.4	8.3	33.3

REVENUES AND COST COMPARISONS

A comparison of expenditures and receipts is very important. If revenue receipts are greater than the amounts spent for operation, maintenance, interest and outlays, there is a balance which may be applied to reduction of indebtedness. If the balance is on the other side, it means an increase in the indebtedness. A comparison of statistics shows that the net revenue receipts increased in the years 1903 to 1927 from $439,000,000 to $2,569,000,000 or about 485 per cent. For this same period the increase in cost for operation and maintenance was 469 per cent, for interest 446 per cent, and for outlays 453 per cent. The total governmental cost payments increased from $514,000,000 in 1903 to $2,887,000,000 in 1927, or 461 per cent. This is a considerably smaller percentage of increase than that of revenue, showing a decided tendency to increase the proportion of outlay payments to be met from revenues.

MUNICIPAL REVENUES

Amount and Sources.—Municipal expenditures of course necessitate revenues. The following table shows the absolute and percentage increase of net revenue receipts for certain years beginning with 1903.

Year	Amount	Per cent of increase over 1903
1927	$2,568,749,135	485.0
1926	2,391,607,422	444.6
1924	2,038,512,388	364.2
1922	1,801,302,485	310.2
1919	1,103,665,750	151.3
1917	968,444,905	120.5
1915	865,270,995	97.0
1913	802,565,390	82.8
1911	751,957,728	71.2
1909	663,379,686	51.1
1907	568,778,828	29.5
1905	498,836,996	13.6
1903	439,126,753	....

PERCENTAGE OF RECEIPTS FROM DIFFERENT SOURCES

Year	The general property tax	Other taxes	Special assessments	Subventions and grants	Earnings of public service enterprises	Other revenues
1927	66.1	5.7	7.7	4.9	9.6	6.2
1926	65.7	5.9	7.2	4.9	10.0	6.4
1924	66.1	5.7	5.9	6.3	10.3	6.8
1922	66.9	5.2	4.8	5.9	9.0	8.2
1919	66.0	7.6	5.6	4.1	10.2	6.4
1917	64.3	7.4	7.8	4.0	9.9	6.6
1915	62.4	7.8	8.5	4.2	10.0	6.9
1913	62.4	8.5	8.2	4.5	9.9	6.6
1911	61.9	8.7	8.4	4.6	10.6	5.8
1909	61.0	9.7	8.4	4.9	10.9	5.3
1907	59.4	10.6	8.2	4.8	11.2	5.8
1905	61.5	9.6	7.9	4.7	11.4	5.0
1903	61.4	9.8	7.6	4.3	11.5	5.5

PER CAPITA RECEIPTS FROM DIFFERENT SOURCES

(Showing tax increases in proportion to population)

Year	Total	The general property tax	Other taxes	Special assessments	Subventions and grants	Earnings of public service enterprises	Other revenues
1927	$69.77	$46.09	$3.95	$5.36	$3.40	$6.67	$4.29
1926	66.14	43.46	3.90	4.75	3.23	6.60	4.20
1924	53.41	38.59	3.33	3.43	3.12	6.00	3.96
1922	53.57	35.85	2.80	2.58	3.12	4.83	4.38
1919	35.26	23.29	2.68	1.98	1.43	3.61	2.27
1917	31.97	20.57	2.37	2.50	1.28	3.13	2.12
1915	30.00	18.73	2.36	2.54	1.26	3.03	2.08
1913	28.55	17.82	2.42	2.34	1.28	2.81	1.88
1911	28.07	17.37	2.44	2.35	1.30	2.98	1.63
1909	26.42	16.14	2.48	2.22	1.28	2.89	1.40
1907	24.67	14.64	2.63	2.02	1.18	2.77	1.43
1905	22.79	14.01	2.17	1.80	1.08	2.60	1.14
1903	21.14	12.98	2.06	1.60	0.91	2.42	1.16

Analysis of Revenue Items.—The general property tax needs no explanation. Under special taxes are included such items as taxes upon corporations, banks, and insurance companies. Here also are placed the taxes levied upon mortgages, receipts from inheritance and income taxes, and all specific property taxes, such as upon acres of land or head of live stock. Some cities make some use of poll taxes and considerable revenue accrues from business and non-business license taxes. Most important among the latter are levies upon automobiles and fees exacted by different departments. Special assessments are levied to defray the cost of specific improvements, presumably upon the property which is benefited by the improvement. Some revenue accrues, also, from fines, profits and escheats, and from subventions and grants from some other political unit such as state or county. Receipts also accrue from the grant of highway privileges, and from rents and interest from various sources. The best example of the former is the payment of public service corporations for the privilege of using the streets, of the public service enterprises, that of supplying water is by far the most general and important.

MUNICIPAL INDEBTEDNESS

The increased demand for extended municipal services, together with different sorts of limit upon the taxing power has caused a greater reliance to be placed upon borrowing. The total and per capita importance of this over a period of years is indicated in the following table:

Year	Gross Debt	Sinking Fund Assets		Net Debt[1]	
		Amount	Per capita	Amount	Per capita
1927	$6,456,781,181	$1,513,273,535	$41.10	$4,943,507,646	$134.27
1926	6,040,399,634	1,407,596,435	38.93	4,632,803,199	128.13
1924	5,057,023,870	1,215,043,841	34.82	3,841,980,029	110.09
1922	4,332,114,718	1,051,468,771	31.27	3,280,645,947	97.57
1919	3,352,688,786	811,516,426	25.93	2,541,172,360	81.18
1917	3,150,424,610	704,573,046	23.26	2,445,851,564	80.75
1915	2,866,008,818	620,102,406	21.50	2,245,906,412	77.86
1913	2,490,461,618	540,454,805	19.20	1,950,006,813	69.28
1911	2,305,059,142	496,230,750	11.52	1,808,828,392	67.52
1909	1,959,162,993	422,063,594	16.81	1,537,099,399	61.21
1907	1,657,320,345	362,441,586	15.68	1,294,878,759	56.04
1905	1,438,741,403	319,395,648	14.53	1,119,345,755	50.94
1903	1,223,101,328	290,096,696	13.90	933,004,632	44.71

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[1] Net debt is funded and floating debt less assets in general sinking funds.

VII. PUBLIC FINANCE AND TAXATION

TAX LEGISLATION

By Beulah Bailey

Librarian, New York State Department of Taxation and Finance

SALES AND LUXURY TAXES

Legislative Sessions.—Even years are light years in legislation, but during 1930 there were 9 states in regular session; Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina and Virgina; and 10 states in special session, Idaho, Illinois, Kansas, Main, Maryland, Nebraska, New Hampshire, Texas, Utah and West Virginia. Fifteen of the states enacted tax legislation.

Mississippi and Kentucky.—This year the cynosure of legislative eyes was the general sales tax and its nearest of kin the luxury taxes. Mississippi and Kentucky both levied sales tax. The Mississippi tax is similar to that of West Virginia, measured by gross sales or gross income. The rates, depending upon the nature of the business, range from one-tenth of 1 per cent to 1 per cent. The exemption is $5,000. This law imposes an additional tax of one-fourth of 1 per cent on the gross income of the business of chain stores. This has been held discriminatory and a temporary injunction has been granted restraining the collection of this additional tax. In Kentucky this tax is based upon gross sales and the rate depends not upon the nature of the business but upon the amount of the business. It ranges from one-twentieth of 1 per cent of gross sales up to $400,000 to 1 per cent of sales over $1,000,000.

Tobacco Tax.—Mississippi levied for the first time a tax upon tobacco. The rate is 1 cent for each 5 cents of the retail selling price of cigarettes and 20 per cent of the selling price of cigars. In 1929 both Michigan and New Mexico levied a tobacco tax, but in both cases the referendum was invoked and the tax was in both cases rejected by the electorate.

Amusement Tax.—Mississippi also levied a tax of 1 cent for each 10 cents or fractional part thereof on all admissions to amusement places, including public bathing places and public dance halls.

Malt.—Another luxury tax, if it can be legally classed as such, is the malt tax. Louisiana levied a tax upon malt extracts in 1928 and it was not successful as a revenue producer. The evasion was too great. A 1930 law amends the former 1928 law reducing the rate from 10 cents a 16 ounce pound to 3 cents. South Carolina levied a 10 cent per pound tax upon all malt or malt extracts or substitutes.

Radio Tax.—South Carolina also levied a tax ranging from 50 cents to $2.50 upon radios. The constitutionality of this tax has not as yet been determined.

CHAIN STORES

South Carolina levied a new tax upon chain stores as their former law was held unconstitutional. Under the former law only stores above four were taxed. The 1930 law levies a tax ranging from $5 on the first store, $10 on the second, and so on up to $150 on the thirtieth and each store in excess. The Tax Commission has already been temporarily restrained from collecting this tax. The chain store tax was this year held constitutional in Georgia and North Carolina and unconstitutional in Indiana. In every case there has been an appeal to the United States Supreme Court.

DEATH TAX

The outstanding death tax legislation of the year was the estate tax of New York. The transfer tax and former estate tax on estates over $200,000 were repealed and a new estate tax, the rates of which are four-fifths of the Federal, was enacted. Estates of less than $5,000 are not taxable. The exemptions are $20,000 for husband or wife and $5,000 for all others. The law is centrally administered. Under this law New York is placed among the states that do not tax the intangible personalty of non-resident decedents. Prince Edwards Island and Saskatchewan this year passed reciprocal legislation. Kansas picked up the Federal credit by levying an estate tax equal to the difference between the existing Kansas tax and the 80 per cent Federal credit. A constitutional amendment was adopted in Florida permitting the levying of a death tax which will enable Florida to take advantage of the Federal credit.

INCOME TAX

Amendments.—In Georgia, a constitutional amendment permitting an income tax was defeated but the statutory income tax passed in 1929 has been held constitutional and that answers every purpose. Income tax and classification amendments carried in Utah but income tax amendments were defeated in Kansas, New Hampshire and Illinois. In the latter state, the amendment provided for classification as well as the income tax. The referendum was invoked in Oregon and Arkansas. In both states the income tax carried.

Rate Changes.—South Carolina increased its income tax rate on corporations from 4 per cent to 4½ per cent and increased the personal income tax rate by lowering the brackets. They now range from 1 per cent on income of $1,200 to $2,000 to 5 per cent on all over $8,000. The exemptions were decreased from $1,500 to $1,200 for single people and from $2,500 to $2,200 for heads of families. Virginia increased its income tax exemptions from $1,000 to $1,250 for single people and from $2,000 to $2,800 for married.

BANK TAX

The bank tax situation is much more complicated this year than it was last year. The results of the Macallen decision have been far-reaching. The 1929 law of Washington has been declared unconstitutional. In Oregon, the money collected from the 1929 excise tax is being held up by the State Treasurer as unreceipted until the constitutionality of the law is decided. Michigan did not have an income tax on banks but the law they had has been held unconstitutional. Mandamus proceedings have been brought in Kansas against the Tax Commission to test their power in taxing share of stock of banks, mortgage companies and trust companies.

CLASSIFIED PROPERTY TAX

Kansas repealed its 1927 classified property tax on intangibles but the mortgage registration fee is retained. The Supreme Court of Oregon has held the intangible tax law, based upon income derived by individuals from interest and dividends, unconstitutional. The law applied to individuals only and not to corporations and hence was discriminatory. In November, 1929, the voters of Ohio passed the constitutional amendment permitting classification. This becomes effective January 1, 1931. This November Washington and Utah passed amendments permitting classification and Illinois rejected one. North Carolina also voted upon classification.

CORPORATION TAX

The former corporation tax law of Texas was held unconstitutional and a new franchise tax was enacted. Mississippi levied a franchise tax upon the capital stock of all organizations organized for profit. Tennessee, at a special session in December, 1929, amended the capital stock tax so as to provide that corporations may at their option pay either a tax of one-half of 1 per cent of gross receipts from intrastate business with a minimum of $25 or pay on their authorized capital stock as in the existing laws. Exemptions for the encouragement of industries were granted in certain counties in South Carolina. In Virginia local governmental units are given authority to make such exemptions. Florida and Louisiana adopted constitutional amendments permitting it.

EQUALIZING THE TAX BURDEN

At the November, 1930 elections, about $300,000,000 on bond issues was approved by the electorate of the nation. Only about $75,000,000 of states and municipal issues were defeated. These bond issues and the ever increasing cost of government, especially local government, will mean increased taxes. In nearly every state in the union the real property tax is bordering on confiscation. (Arizona passed a constitutional amendment permitting only owners of real property to vote upon bond issues and special assessments.) During 1930 seventeen state legislatures or governors appointed special investigation commissions to make a study of how to equalize the tax burden. Counting the ones already functioning there are now about thirty-one states conducting studies of tax conditions. With economists, legislators and administrators all united in an attempt to produce a workable and practicable system of taxation, which will distribute the tax burden as evenly and widely as possible, it would seem that the day of tax equity is at hand, that is, if the electorate will do their share.

LAND AND PROPERTY TAXES

By Jens P. Jensen

Professor, University of Kansas

COMMISSIONS FOR TAX RELIEF

There is an insistent pressure for relief from heavy property taxes. One manifestation is the larger number of investigating commissions created. A number of such commissions was appointed in 1929, and in 1930 seventeen more, a large number in view of the fact that only nine states held regular and only ten, special sessions. Directly or indirectly, all of these commissions are required to relieve property from heavy taxation, although several are to consider income taxes and some to seek a more equitable apportionment of the tax burden. In Colorado, where the 1929 legislature failed to provide a commission, the Denver Chamber of Commerce financed a survey of the state tax system. The commissions vary much in form. Thus in Ohio the governor has appointed a commission of upward of 180 members to consider the situation under the constitution as amended in 1929 to permit classification. Only a few commissions have rendered reports at all, and in not all cases do the reports contribute appreciably to the solution of even the state's own tax problem.

ADMINISTRATION

Utah, at the November election, adopted a constitutional amendment creating a bipartisan tax commission of four members, to be provided for by statute. The tax commission of Arizona, which in 1929 was authorized to resolve itself into a Board of Tax Survey and to make a "scientific" survey of all property in the state, complete before Jan. 1, 1930, and every five years thereafter, has been blocked in its efforts to comply with that requirement. The assessor of Maricopa County was enjoined (288 Pac. 1034) from extending the 1930 taxes on the basis of the values of the survey until the values should be available for the entire state.

ASSESSMENT

Arizona.—Property must be assessed by the proper officer if the tax is to be valid, as in Arizona (285 Pac. 998) where the law prescribes that the state tax commission must assess railroad property; and where, therefore, an assessor may not assess such property, nor may he take the local apportionment of railroad property, as a basis for a special tax; the tax commission must make such special assessment.

Maine.—In Maine (151 Atl. 670), as elsewhere of course, the assessment must be made by a legally competent officer; and an invalid assessment cannot be cured by a validating act of the legislature.

Pennsylvania.—(148 Atl. 301) the

foot-acre rule may be used in assessing coal lands, where there is no market value, provided all factors affecting a hypothetical market value are also considered.

Colorado.—(288 Pac. 408) taxes assessed for a proportionate period against grazing cattle were valid; but money paid voluntarily in earlier years, while there was no law authorizing such taxes could not be legally retained by the county to which it had been paid.

New Jersey.—(144 Atl. 629) "1923 taxes" are those based upon the 1922 assessment. Hence a company having sold property to the state free from "1923 taxes" is not bound to pay taxes based on the 1922 assessment payable in 1923.

Louisiana.—(120 So. 23) personal property is taxable to owner as of Jan. 1, though sold shortly afterwards and not in his possession on the day of assessment.

Oklahoma.—(274 Pac. 480) the state board of equalization has power to assess all property and may correct mistakes any time; also in (278 Pac. 271).

Connecticut.—(147 Atl. 9) property held for life may be assessed to the holder, but if held under contract to the owner, a special law requiring assessment to the lessee being arbitrary and invalid.

North Carolina.—(149 S. E. 680) notes for deferred payment under contract for sale of timber land are "solvent credits" and thus taxable as general property, though timber cutting rights were retained and gradually released as the payments were made. In that state also (146 Atl. 861) tax evasion through temporary conversion into tax exempts is unassailable, not constituting conversion for purposes of tax evasion, though a law makes such procedure a misdemeanor.

CLASSIFICATION

Washington and Utah.—These states adopted constitutional amendments at the November election which would permit the classification of property for taxation. In Washington all real estate must be in one class; debts secured by property on which taxes are paid in Washington are exempt; and the legislature is authorized to provide for the taxation of mining and forest property. In Utah all tangible property must be in the same class but intangibles may be exempt, be subject to a low rate not exceeding 5 mills, or be subject to an income tax; in any event, of the revenue from the taxes on intangible property, 75 per cent must go for education and the remainder to the state general fund, and the legislature was authorized to provide for the taxation of mines.

North Carolina.—A constitutional amendment voted on for the second time was apparently defeated, thus barring classification in this state.

Missouri.—An amendment voted on that would exempt debts secured by Missouri real estate failed of adoption.

Idaho.—(290 Pac. 714) the 1929 tax on shares of stock of banks and building and loan associations is a tax on the shares to the shareholders and not collectible in Utah where plaintiff has no property and does no business.

Kansas.—The repeal by the legislature of the five-mill tax on money and credits has made the position of the classified property tax still more insecure. The decision in case of Voran *vs.* Wright (281 Pac. 938) had held the entire law, taxing money and credits, unconstitutional. Upon rehearing (284 Pac. 807) the court so modified the decision as to hold unconstitutional only that part of the law which classified bank shares under the general class of property subject to the *ad valorem* tax. In another case (286 Pac. 673) it was sought to have applied to real estate the same rate as applied to money and credits in general, and under the recent decisions in the bank tax cases, to bank shares, namely five mills. To this construction the earlier decisions appeared to give some foundation. But the courts professed to look behind the form of the law and to find in the case of real estate something tangible, while back of the bank shares there were only intangible assets, which were generally either exempt, or not taxed, or taxed at a low rate. One reason for the legislative repeal was the large amount of protested taxes on the bank shares for previous years which it had become necessary to refund, and which had made the banks very unpopular.

Alabama and Kentucky.—In Alabama (123 So. 6) the law permitting the shares of stock of a foreign corporation to be registered and thereafter be exempt from the general property tax was held valid. The tax was held to be an excise tax and hence not required to conform to the uniformity rule of the state constitution. The Kentucky classification by which shares of a corporation having 75 per cent of its property in Kentucky are exempt, is not invalid by reason of being violation of the due process clause.

UNIFORMITY

Under proper conditions the courts will enforce uniformity of the assessment and grant relief from excessive taxes. In Illinois the Chicago investigation of Valuations in Cook County in 1927 has apparently furnished evidence to prove that the assessors knowingly and willfully discriminated. The State Supreme Court, on June 20, and in denying rehearing on October 10, 1930 (172 N. E. 772) upheld a petition to restrain the collection of taxes based upon such valuations, and in doing so took a more liberal and practical view of the state uniformity rule. In Missouri the state supreme court in 1923 held the state tax commission had no power to grant relief from excessive valuation. Later this court dismissed a petition for such relief on the ground that plaintiff had not exhausted the means for administrative relief, namely, by petition to the tax commission. The Federal court (281 U. S. 673) held that the state court had denied relief to which plaintiff was entitled. Relief from excessive valuation was granted by the state courts in Texas (15 S. W. 2nd 715), Florida (123 So. 745), Iowa (228 N. W. 28), Pennsylvania (149 Atl. 653), and Massachusetts (170 N. E. 819). It was denied in Ohio (32 Fed. 2nd, 639) because it was sought in Federal courts before exhausting state and local remedies, the proper procedure being to protest to assessing officials and the state tax commission, and the proper justifiable stage being when the property appeared upon the tax duplicate, after payment under protest; also in North Carolina (32 Fed. 2nd, 570). It was denied in Mississippi (127 So. 686) in case of bank stock since equality is not required by the state constitution; and in Oklahoma (281 Pac. 958) for a similar reason in case of bank stock. And in Washington (281 Pac. 494) mere overvaluation by assessor acting in good faith is no cause for relief in equity. In Florida (128 So. 264), a city using lawfully a higher assessment ratio than the rest of the state cannot raise the assessment of the centrally assessed railroad property apportioned for local assessment, which decision, of course, involves discrimination if the city chooses to use the higher ratio. In South Dakota (223 N. W. 342) a tax limit of 10 mills for agricultural property, with certain exceptions, is an arbitrary and unreasonable discrimination, where no such limit exists for taxes on other property. And in Louisiana (126 So. 207) the fact that the taxpayers of the original school districts must pay a higher rate of tax than paid by taxpayers of a later addition, as through earlier bonds issued, does not constitute violation of the uniformity requirement of the constitution.

SITUS

In Arkansas (11 S. W. 2nd, 455) residence, as distinct from domicile or home, is the taxable situs. In California (284 Pac. 1072) mineral rights reserved in perpetuity are real estate and assessable as such, where located. In Maine (148 Atl. 799) water power is situated for taxation purposes where the mill privilege exists, and failure to build dam makes land assessable on the basis of the value of the unused capacity. In Iowa (225 N. W. 344) bank accounts of a local agency of a foreign corporation have acquired a business situs and would be there taxable when and if the legislature should so provide by law. In Mississippi (119 So. 310) situs of tank cars is at domicile of corporation unless and until the legislature should provide otherwise, and such legislation cannot be presumed retroactive. In Texas (16 S. W. 2nd, 292) switching engines may have a physical but not a business situs in a city, the rolling stock being by law returnable at the domicile of the corporation. In Maryland (143 Atl. 656) intangibles of a partnership resident of Baltimore are taxable in Baltimore, though the partners may reside elsewhere. In California (273 Pac. 1066) shares of stock held by a Wisconsin corporation for a California beneficiary formerly resident of Wisconsin, are taxable as a beneficiary interest, while beneficiary is living, and much more so after the shares have passed to the California executor.

PROPERTY TAX EXEMPTIONS

Encouraging Business.—The cases in which the exemption is granted for the purpose of encouraging business are the most numerous and important. Nov. 4 Florida voters approved a constitutional amendment sanctioning an exemption for 15 years for companies generating hydroelectric power, and for certain other activities, no exemption to continue beyond the year 1948. The exemption applies to all the operative property including real estate. The action of Florida is characteristic of other states of the old South. Under a similar provision in South Carolina the Duke Power Company (152 S. E. 865) won exemption for its plant. Likewise, under the Kentucky provision exempting manufacturing machinery, the Illinois Central Railroad secured exemption of its shops in Paducah (14 S. W. 2nd, 172) on the ground of being engaged in manufacturing, though not as its principal activity. In Mississippi (120 So. 839) the exemption granted to permanent hotels contracted or commenced before 1928 was held not to extend to furniture, fixtures and equipment. In Maryland the Baltimore and Philadelphia Steamship Company (145 Atl. 770) enjoys the exemption granted to vessels engaged in coastwise trade, when the vessels are employed entirely on the inland waterways.

Federal Agencies.—Perhaps the cases of exemption arising from the relationship of the Federal Government either by way of ownership or control, are only slightly less important. In a Missouri case (281 U. S. 313) the state was required by the U. S. Supreme Court to permit the deduction in full of all the Federal bonds owned by an insurance company in computing the tax on its personal property, the state tax commission having allowed only a proportionate part of such assets. The Supreme Court (280 U. S. 363) reversed the State Supreme Court of Oklahoma which had sanctioned a tax on certain Indian oil lands leased for exploitation. In Wisconsin, automobiles in the original package are free from state property taxes when coming from Michigan, but not when from some other part of the taxing state (224 N. W. 126). In New Jersey (151 Atl. 29) a power company licensee of the Federal Power Commission is not a Federal agency so as to be exempt from taxation on its property unless the tax interferes with some Federal function; and its tax liability includes the value given to its property by Federal and state licenses, though these licenses, as such, are not taxable. In Indiana (159 N. E. 19) it was held that title to property sold by the United States does not pass until the last payment has been made, and the property is exempt till then.

Property Status.—In Washington (270 Pac. 813) and Montana (279 Pac. 369) irrigation districts are not municipal corporations so as to be exempt from taxes on their property. In Louisiana (120 So. 286) property acquired by a city after the tax day, January 1, is not assessable as of January 1 on July 6, although ordinarily the status of the property on the tax day determines its tax liability. Thus in Illinois (168 N. E. 275) a levy at the rate of 66⅔ cents per $100 was valid even though the limit had been reduced to 33⅓ cents before the collection, but after the act of levying. This is also seen in an Iowa case (224 N. W. 502) where a college acquired property after the day of assessment, Jan. 1, and the property was exempt from a tax levied on September 8. In South Dakota (222 N. W. 583) lands taken by the state in foreclosure under the rural credits act are exempt, being public property, the court declining to recognize any distinction between the "sovereign" and "non-sovereign" capacities of the state. In Wisconsin (224 N. W. 132), property deeded to the regents of the state university and by them leased back to the grantor, is public property and, as such, exempt, though the lessee might have a taxable interest therein.

Religion and Education.—The determination of the exemption of property used for religious purposes is fairly clear. In Texas (17 S. W. 2nd, 130) it is reiterated that church property to be exempt must be used exclusively for church purposes. Less definite is the boundary line between exempt and taxable educational property. In Connecticut (149 Atl. 685) property of a school, in case of dissolution left to the bishop of the Catholic church, was not exempt because the grant did not contain assurance that the property might not be used for private profit. In Illinois (168 N. E. 269) the dormitories and dining hall of a college were not "leased to the students" or "used for profit" so as to be taxable. In Oregon (279 Pac. 555) a "Greek letter" fraternity was not charitable, benevolent, religious, literary, or scientific, and hence not exempt. In Illinois the same kind of property was exempt (167 N. E. 16) even though the organization occasionally rented rooms to non-members. A Kentucky farm belonging to an Ohio library and museum was held (22 S. W. 2nd, 597) to perform no governmental services in Kentucky and hence not exempt in Kentucky.

INCOME TAXES

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FEDERAL INCOME TAX

Rates.—The income tax provisions of the Revenue Act of 1928 remained in force during 1930, except for the reduction of both the normal personal tax and the corporation tax by one per cent. This reduction applies only to the 1930 tax on 1929 incomes. The Revenue Act of 1928 provides normal rates of 1.5 per cent on the first $4,000 of taxable income, 3 per cent on the next $4,000, and 5 per cent on all over $8,000. The surtax rates begin with 1 per cent on net income in excess of $10,000 and reach a maximum of 20 per cent on net income in excess of $100,000. A credit of 25 per cent of the normal tax is allowed on all net income under $5,000 and on "earned" net income under $30,000. Personal exemptions are $1,500 for single persons, $3,500 for heads of families, and $400 for dependents. The exemptions for estates and trusts is $1,500. The corporation income tax rate is 12 per cent and the specific credit granted to domestic corporations with a net income of $25,000 or less is $3,000.

Collections.—Revenues from both the personal and corporation income taxes increased for the fiscal year ended June 30, 1930. The unusually active business during the early months of 1929, and the fact that part of the collections were on 1928 incomes, more than offset the one per cent reduction in rates on 1929 income and the losses resulting from the break in the stock market near the end of the 1929 income year. However, collections for personal and corporation income taxes combined for the first quarter of the fiscal year 1930-31 were nearly $51,000,000 below collections for the same quarter of the year preceding.

REVENUES FROM FEDERAL INCOME TAX

(in thousands of dollars)

Fiscal	Corporation	Personal tax	Total tax	Per cent of all Federal taxes from income tax
1929-30	$1,263,575	$1,146,656	$2,410.231	66.5
1928-29	1,235,733	1,095,541	2,331,274	66.0

STATE INCOME TAXES

Rates and Exemptions.—The year has brought no new state income taxes and has resulted in few changes in existing taxes. South Carolina, however, has increased the rate of the corporation income tax from 4 to 4½ per cent; and has increased the personal income tax by reducing the personal exemptions on the one hand, and increasing the rate of progression on the other, so that the maximum rate of 5 per cent applies on taxable income in excess of $8,000 instead of taxable income in excess of $15,000. South Carolina has also adopted a reciprocal provision for non-residents taxed on their income in the state of residence. Such non-residents may be credited with that proportion of the tax in their home state represented by the proportion of their income arising in South Carolina, providing the home state allows a similar credit. Virginia, unlike South Carolina, has increased the exemptions for personal incomes. It is estimated that the change will cut the proceeds of the tax by about $300,000. In corporation income taxes New York increased the minimum tax on corporations subject to the net income tax from $10 to $25. Massachusetts redefined the taxable income of national banks and trust companies to be such income as would be taxable if held by an individual inhabitant of Massachusetts. This change was made as a result of the Macallen decision.

Amendments.—At the November elections a constitutional amendment was passed which makes a tax from the income of intangibles possible in Utah; another measure was passed in Oregon providing for certain income tax exemptions. Amendments making an income tax possible in Illinois and Kansas were defeated, as was also an amendment in New Hampshire providing for income tax exemptions.

Court Decisions.—A decision of the State Supreme Court of Georgia holds the new income tax law in that state to be constitutional; and a decision of the Supreme Court of North Carolina holds that the method of computing the proportion of net income of foreign corporations taxable in that state is constitutional. In Washington the State Supreme Court, in two decisions held that the new income tax on banks and financial corporations is invalid. In Wisconsin the Tax Commission has handed down a decision exempting insurance companies and steam railroads and sleeping car companies from the income tax.

Present Status.—Twelve states are taxing both personal and corporation income. Four states are taxing personal income only. Three states have taxes on corporation income only. All of these states except Delaware, Massachusetts, New Hampshire and Tennessee tax such income of non-residents as they can reach. New York, North Carolina and South Carolina, however, credit non-residents with the amount of any income tax paid in the state of residence if such state allows similar credits. All of these states but Wisconsin tax residents on income derived from outside the state, with only Missouri, North Carolina and South Carolina allowing credits for income taxes paid in other states.

VII. PUBLIC FINANCE AND TAXATION

STATE PERSONAL INCOME TAX EXEMPTIONS AND RATES

State	Year first effective	Personal exemptions			Rates of tax (per cent)	Amount of taxable income in excess of which maximum rate applies
		Single	Head of family	Dependents		
Ark.	1929	$1,500	$2,500	$400	1 -5	$ 25,000
Del.	1917	1,000	2,000	—	1 -3	10,000
Ga.	1930	1,500	3,500	400	(a)	100,000
Mass.	1917	2,000	2,500	250 (b)	1½-6 (c)	—
Miss.	1914	1,500	3,500	400	2½-5½	15,000
Mo.	1917	1,000	2,000	200	1	—
N. H.	1924	200	200	—	(d)	—
N. Y.	1919	2,500	4,000	400	1 -3	50,000
N. C.	1921	1,000	2,000	200	1¼-5	15,000
N. D.	1919	1,000	2,000	300	1 -6	10,000
Okla.	1913	3,000	4,000	200-500	¾-2	25,000
Ore.	1930	1,500	2,500	400	1 -5 (f)	4,000
S. C.	1922	1,200	2,200	400	1 -5	8,000
Tenn.	1929	(e)	(e)	—	5 (i)	—
Va.	1843	1,250	2,800	400	1½-3	5,000
Wis.	1911	(g)	(g)	(g)	1 -6 (h)	12,000

(a) One-third of Federal income tax rates. (b) Exemptions apply to earned income. There is a flat exemption on unearned income of $300. (c) One and one-half per cent on earned income and annuities; 3 per cent on capital gains; 6 per cent in interest and dividends. (d) Average rate on real estate. This was 2.8 per cent in 1930. Applies only to income from dividends and interest. (e) Income from $1,000 worth of bonds or stocks. (f) Exemptions and rates do not apply to income from intangibles. This is taxed at 5 per cent with a $200 exemption. (g) In place of exemption taxpayers must deduct from their tax after it has been computed. $8 for a single person, $17.50 for a head of family, and $3 for each dependent. (h) Including surtax for teachers' pensions rates are 1-1/6 to 7 per cent. (i) Applies only to income from dividends and interest.

DIGEST OF STATE CORPORATION INCOME TAX PROVISIONS

State	Year when first effective	Kind of corporations exempt	Amount of income exempt	Rate of tax (per cent)	Exemption of dividends of other corporations paying income tax to state	Exemption of interest from government bonds
Ark.	1929		$1500	2	—	x
Cal.	1929	Public utilities; insurance	—	4	x	—
Conn.	1915	Public utilities; insurance; banks	3000(a)	2	—	—
Ga.	1930	Insurance	3000(a)	4	—	x
Mass.	1919	Public utilities; insurance	—	2½ (b)	x	—
Miss.	1914	Banks	1500	2½-5½ (c)	x	x
Mo.	1917	Express; insurance; banks	—	1	—	x
Mont.	1917	Express; national banks	2500	1	—	—
N. Y.	1917	Public utilities; insurance; real estate	—	4½	—	—
N. C.	1921	Foreign insurance; national banks	—	4½	x	x
N. D.	1919	Insurance; national banks	—	3	x	x
Ore.	1930	Public utilities; insurance; real estate	—	5	—	—
S. C.	1922	Insurance; banks	—	4½	x	x
Va.	1927	Public utilities; insurance; banks	—	3	x	x
Wis.	1911	Public utilities; insurance	—	2-6(d)	x	x

(a) Same as Federal. (b) Bank rate to be determined by Commissioner; not to exceed highest rate applied to business corporations. This was 5.62 per cent in 1929. (c) Same as personal maximum on taxable income in excess of $5000. (d) Six per cent applies to all income in excess of $6000.

Revenue From State Income Taxes.—In Arkansas $500,000 of the tax is credited to the charities fund and $750,000 to the common school equalization fund. The remainder is for general state use. In Delaware the greater part of the proceeds of the income tax are credited to the state school fund. In Massachusetts the state retains the temporary additional tax and enough of the regular tax to cover the cost of administration. The remainder is distributed to the local districts. In New Hampshire, also, the proceeds over the cost of administration are turned over to the towns and cities. In New York half of the personal income tax, and one-third of the corporation income tax and all of the bank income tax are distributed to the local districts. In Wisconsin the surtax is used for special state expenditures, but only 40 per cent of the normal tax is kept by the state. In the other states the proceeds are all kept for general state purposes.

REVENUE FROM STATE INCOME TAXES
(in thousands of dollars)

State	Amount from personal income	Amount from corporation income	Amount for state purposes	Amount for local purposes	Fiscal year ending
Ark.	$ 425	$ 331	$ 756	—	Dec. 31, 1929
Cal.	—	6,155	6,155	—	Feb. 28, 1930
Conn.	—	2,984	2,984	—	June 30, 1930
Del.	2,853	—	2,853	—	June 30, 1930
Ga	200(b)	700(b)	900(b)	—	Dec. 31, 1929
Mass.	27,720	5,055	1,576	31,199	Nov. 30, 1929
Miss.	665	970	1,635	—	Sept. 30, 1930
Mo.	2,802	1,450	4,252	—	Dec. 31, 1929
Mont.	—	441	441	—	June 30, 1930
N. H.	615	—	10	605	June 30, 1930
N. Y.	81,655	55,590	80,659	56,586	June 30, 1930
N. C.	1,699	5,592	7,291	—	June 30, 1930
N. D.	259	256	515	—	June 30, 1930
Okla.	524	—	524	—	June 30, 1930
Ore.	897	628	1,525	—	Sept. 30, 1930
S. C.	437	1,666	2,103	—	Dec. 31, 1929
Tenn.	584	—	584	—	June 30, 1930
Va.	2,289	1,964	4,253	—	June 30, 1930
Wis.	8,954(a)	11,230(a)	9,831	11,617	June 30, 1930

(a) Assessment. Division between personal and corporate estimated.
(b) Estimate.

CORPORATION AND BANK TAXES

By Jens P. Jensen

Professor, University of Kansas

CORPORATION TAXES

Legislation.—During 1930 there was almost no legislation relating to taxes on corporations as such. Most of the court decisions have been concerned with the determination of the proper basis for the corporate franchise tax. In a special session the Tennessee legislature amended the capital stock tax so as to provide that corporations may pay at their option either a tax of ½ of 1 per cent of gross receipts from interstate business, with a minimum tax of $25, or pay on their authorized capital stock under the law as it existed before the session. In California a constitutional amendment was adopted on November 4, which reduced the rate of the gross receipts tax on street railways from 5¼ per cent to 4¼ per cent.

Interstate Commerce.—In Illinois (166 N. E. 501) the state court upheld the franchise tax in case of a corporation whose property was located in Illinois, but 80 per cent of whose sales were outside the state. The computation of the tax was based on the assumption that all the business was done in Illinois, and that the tax was no burden on interstate commerce. The decision was upheld by the U. S. Supreme Court (281 U. S. 511). A similar issue was involved in an earlier case (164 N. W. 667). A Utah tax on corporations based on authorized stock is invalid (284 Pac. 328) in that it applies indivisibly to those doing and to those not doing interstate business and having property outside. In Nebraska (227 N. W. 926) it is not a burden upon interstate commerce for a corporation having about 6 per cent of its property in the state to pay taxes on its entire capital stock. This case, however, is being taken to the Federal courts and may be reversed. So also in Michigan (224 N. W. 653) all intangible value of a domestic corporation is taxable in Michigan.

Gross Receipts Tax.—In the two states that conspicuously use the tax on gross receipts in lieu of the general property tax on railroads and other enterprises, there arise points of disagreements. In California (274 Pac. 962) a new plant, tardily reported in operation, was assessed for local *ad valorem* taxes, and the tax sustained by the state board of equalization and the courts. Similarly in a later case (277 Pac. 741), a motor common carrier assigning its delivery business to a subsidiary corporation is not subject to the gross receipts tax (284 Pac. 663) as to this part of the business, it being deemed legitimate for a business enterprise so to organize its business as to minimize its taxes. But ferryboats transporting passengers are "operative" property subject to the gross receipts tax (291 Pac. 197). It is within the power of the legislation to fix different rates for railroads than for street railways (290 Pac. 25). In Minnesota (232 N. W. 105) receipts from the operation of union station owned jointly by the carriers, including checking room receipts, are operating revenue; so also are the excess receipts from Pullman service, when not already taxed as such to the Pullman Company. Where, as in New Jersey, the gross receipts tax is not in lieu of the general property tax on the operative property it may be disturbed by the case of New Jersey Bell Telephone Company *vs.* State Board of Assessors (280 U. S. 338). The New Jersey franchise tax of 5 per cent of gross earnings of all local traffic plus a mileage rate, pro rata, of interstate traffic, though it has been long in use, was held arbitrary and a burden upon interstate commerce.

No Par Stock.—In New York (164 N. E. 253) a tax of 6 cents per share of no-par stock is valid for corporations beginning business after the enactment of such a tax, but not for those being in business when the tax became effective. In Illinois (172 N. E. 705) a company substituting no-par stock was held not liable for any additional franchise tax.

Miscellaneous.—In Pennsylvania (146 Atl. 896), roasting coffee is not a manufacturing process so as to be entitled to the advantages of the tax on manufacturing corporations as against those on mercantile corporations. Also (147 Atl. 98) a motor finance corporation dealing in automobiles is not a financial but a mercantile corporation to the extent that it has title to automobiles in possession of lessees under bailment leases. In New Jersey (151 Atl. 75), a corporation organized to hold and operate a railroad in Central America is subject to the corporation franchise tax in lieu of the tax on railroad companies in the state. In Iowa (223 N. W. 744) funds held by an insurance company for the payment of the money and credits tax in behalf of its shareholders, are a liability of the corporation and hence deductible from the value of its shares. In Pennsylvania a holding corporation (147 Atl. 242) must be given credit for stocks held in determining the capital stock tax on its own stock. A similar requirement applies to holding companies in Kansas (280 Pac. 786) for the purpose of determining the value of the corporate excess tax. Also in Kansas (278 Pac. 39), an insurance company may deduct from its capital stock, not only its legal reserve but also the domestic real estate mortgages held, on which the recording tax has been paid. In Tennessee (29 S. W. 2nd 253) a corporation is not doing business and hence not subject to the corporate excise tax when its sole activity in the state is to hold patents and receive royalties from a Connecticut corporation not operating in Tennessee. A Texas corporation doing business in New York, but having bank balances wholly designed for use outside of the state of New York need not include such balances for the purpose of determining its New York franchise tax (168 N. E. 449). In Minnesota (232 N. W. 35) a mining company may not, in computing its occupation tax, deduct the sum paid in royalties to the owner, or any part thereof, although such royalties are subject to the supplementary royalty tax.

BANK TAXATION

Legislation.—The nineteen legislative sessions, regular and special, did not enact any significant laws affecting bank taxation. Also, the court decisions offer little that is new. Apparently the taxation of banks has reached the point where any new developments must be sought in appropriate action of Congress, by way of amending U. S. R. S. Section 5219, upon which depend directly the power of the states to tax national banks and, indirectly, the power to tax state banks. That is why the proposed amendment to Section 5219 is of the greatest importance. The joint drafting committee of the American Bankers' Association's Committee on Taxation and of the Committee of States, has agreed on a bill presented as the Goodwin bill, but not passed in Congress. It will be presented again at the next session.

Goodwin Bill.—This Goodwin bill, if enacted, would liberalize Section 5219 in two ways: first, the *ad valorem* tax on bank shares in states having low-rate taxes on intangibles, would be deemed reasonable when the rate is not higher than the rate upon financial, manufacturing, and mercantile corporations of the state, measured by the ratio of aggregate taxes to profits in both cases; second, the permission to impose a specific tax on the shares, the basis of which shall be the net profit, consisting of dividends paid plus net increase in capital stock, surplus and undivided profits, per share of stock. The rate shall not exceed the rate, similarly determined, upon financial, manufacturing and mercantile corporations of the state. There may be however a minimum specific tax of not to exceed one mill on each dollar of the value of such share. Both of these features would be contingent upon provision by the state of adequate statistical information to determine the equality required. It appears that the income from tax exempts might be included for purposes of determining the basis for the tax. It would also appear that the proposed amendment would permit a more liberal use of more than one of the alternative methods provided.

Kansas.—The repeal of the five-mill intangible tax law of 1927 automatically placed the Kansas banks on the former *ad valorem* basis. Numerous suits are pending in that state contesting the *ad valorem* assessment on diverse grounds but chiefly on the ground that it involves double taxation. The Kansas legislature also provided that all unincorporated financial enterprises should be taxed as on the banks on the capital employed. The outcome of this law is problematical.

Montana.—In case (272 Pac. 691) it was held that bank stock which at the time of the origin of the suit was assessable at 40 per cent of its value should be assessed at 7 per cent thereof which is the classification taken by money and credits. A year ago bank stock was shifted through legislation from the class where it was assessable at 40 per cent of its value to the class in which it is assessable at 30 per cent thereof. It appears that this shift does not establish a satisfactory and legal basis for the taxation of banks.

Washington and Oregon.—(289 Pac. 551 and 289 Pac. 555) last year's franchise tax was held unconstitutional as being not a true corporate franchise tax since it applied to partnerships and individuals doing a banking business but was upon rehearing designated as an ineffective attempt to classify property for taxation. It was of course not the banks that contested the law. That was done by the building and loan associations which under the contested law are treated as banks in Washington but were and are largely exempt elsewhere. Holding the franchise tax law invalid has given significance to the decision in the case of Spokane and Eastern Trust Company *vs.* Spokane County (280 Pac. 3) in which it was held that intangible assets of a bank exempted by statute must be deducted in determining the taxable value of the shares. In two other cases (280 Pac. 16 and 280 Pac. 25) it was held that since competing moneyed capital escaped taxation, the banks could recover taxes paid on their shares. The fourth alternative of Section 5219, the excise tax measured by net income, is thus ruled out in Washington. In Oregon, the money collected under this tax is being held unreceipted until it shall be determined whether the law is constitutional.

California.—It is asserted by the attorney general that the Macallen case does not apply to the 1929 franchise excise tax on banks, and the banks have not contested the law. The obvious reason is that under it their taxes are much lower than they were prior to 1929. Massachusetts has amended her income tax law so as to conform to the requirements of the Macallen case (279 U. S. 620).

Colorado and New York.—In Colorado (276 Pac. 988) it was held that a Morris plan bank is a bank and taxable as such. In New York such a bank (170 N. E. 502) was in competition with the business of national banks. However, in Iowa (219 N. W. 534) an association employing its capital in making loans of $300 or less was not in such competition. In New York (170 N. E. 502) plaintiff was in competition with the business of national banks when it loaned money on first mortgages and sold mortgages to the public and guaranteed payment thereof. Evidently complete certainty as to what is or is not "competing moneyed capital" under Section 5219 is still afar off.

Mississippi.—(124 So. 480) it was held that the true value of bank-owned real property rather than the assessed value thereof must be deducted in arriving at the taxable value of the shares. Should this deduction be allowed, one of the strong reasons of bankers for objection to the *ad valorem* tax on shares would have been removed.

INHERITANCE TAXATION

BY ALZADA COMSTOCK

PROFESSOR, MOUNT HOLYOKE COLLEGE

GENERAL

The year 1930 was one of progress along two lines with respect to state taxation of inheritances. Multiple taxation came under the ban of the U. S. Supreme Court, and New York State substituted an estate tax for inheritance taxes. In addition, the State of Florida, one of the four—Alabama, Florida, Nevada and the District of Columbia—which did not use inheritance taxes, voted favorably on a constitutional amendment permitting the imposition of an inheritance tax. The Federal estate tax law remained unchanged, with an exemption of $100,000, rates of 1 to 20 per cent reaching a maximum at $10,000,000, and a credit of 80 per cent of the Federal tax on the estate for inheritance taxes paid to the states.

MULTIPLE TAXATION

The changed position of the U. S. Supreme Court with respect to multiple taxation was expressed in a decision handed down Jan. 6, 1930, in the case of Farmers Loan and Trust Co. *vs.* The State of Minnesota. Minnesota, whose inheritance tax law dates from 1897, was one of the nine states—Arizona, Kansas, Kentucky, Minnesota, Montana, North Dakota, Oklahoma, South Dakota, and Utah —which still failed to reciprocate with respect to inheritance taxes. Minnesota was accustomed to impose inheritance taxes upon securities of domestic corporations, municipalities, and the state itself, held by non-resident decedents. Such multiple taxation had long been in force in other states as well, except where it had been abandoned through the adoption of the reciprocity provisions. It had repeatedly been declared legal and constitutional by the Supreme Court.

By the Supreme Court decision handed down on Jan. 6 the earlier cases were overruled. The court declared that "existing conditions imperatively demand protection of choses in action against multiple taxation. . . . We have determined that in general intangibles may be properly taxed at the domicile of their owner and we can find no sufficient reason for saying that they are not entitled to enjoy an immunity against taxation at more than one place similar to that accorded to tangibles. The difference between the two things, although obvious enough, seems insufficient to justify the harsh and oppressive discrimination contended for on behalf of Minnesota." Although the intangibles involved in the case were municipal and state bonds, the decision was expected to diminish the taxation of corporate securities held by non-resident decedents. The decision made even more difficult the position of the nine states which remained outside of the reciprocating group.

LEGISLATION

New York.—The second important event in 1930 in the field of state inheritance taxation was the passage of the Mastick-Pratt bill by the New York legislature. The bill was signed by the Governor April 23, 1930, and became effective Sept. 1, 1930. Like many other states, New York had already in force a so-called estate tax law, but this law was enacted principally for the purpose of allowing the state to take full advantage of the 80 per cent credit allowed by the Federal Government for the payment of inheritance taxes to the states. The law of 1930, however, changed the whole system, and gave New York a basic estate tax in the place of the earlier inheritance taxes. The New York estate tax law of 1930 followed closely the plan of the federal estate tax law. In all brackets except the lowest one the New York rates were 80 per cent of those imposed for similar brackets under the federal law. With respect to the taxation of estates of $100,000 or under, where the Federal law granted complete exemption, the New York law exempted only $20,000 for husband or wife and $5,000 for other near relatives. The remainder was taxed at 80 per cent of the Federal rate. On the smaller estates these rates produced smaller total taxes than those paid under the earlier transfer tax law. The law attempted to avoid the familiar overburdening of the estate of the residuary legatee by estate taxes, through its provision that unless the decedent otherwise directed in his will, the Federal and state estate taxes should be equitably prorated among the persons interested in the estate. The passage of this law was a step forward in simplification and in the reduction of taxes on small estates.

AUTOMOBILE TAXES

BY BEULAH BAILEY

LIBRARIAN, NEW YORK STATE DEPARTMENT OF TAXATION AND FINANCE

LEGISLATION

Changes in Levies and Fees.—There was very little motor vehicle legislation enacted by the 1930 legislators. Kentucky decreased its registration fees by 25 per cent and this without an increase in the gasoline tax. The fee on motorcycles formerly $10 has been reduced to $5. The fee for passenger pleasure cars has been decreased from 25 cents per H. P. to 19 cents and from 40 cents per 100 pounds to 30 cents. Virginia levied an excise tax on motor passenger carriers and property carriers. It is one and one-half per cent of the gross receipts. This excise tax is in addition to the weight tax of 70 cents per 100 pounds. The excise tax in Massachusetts on motor vehicles has been amended so as to provide for taxation by months, for periods of ownership of less than a year with a minimum tax of $2.00. Motor vehicle junk yards must be licensed in New Jersey. Fifty dollars if the land thus used is 5 acres or less and $100 if more than 5 acres. These licenses are issued by the Commissioner of Motor Vehicles. The fees on trucks were changed in New York State from $16 on trucks of less than 1,800 pounds and $8 per ton for vehicles with a gross weight of more than 2 tons to 80 cents per 100 pounds for all trucks. In New York State, humane society automobiles are exempt from this registration fee, in Texas, farm trailers.

AMENDMENTS AND REFERENDA

Florida, Arizona and California voted upon constitutional amendments abolishing the personal property tax upon motor vehicles. It was carried in Florida and California but rejected in Arizona. The people of Oregon refused to give the legislature power to "classify and subclassify property including motor vehicles and to take into consideration use, value and depreciation." In South Dakota the referendum was invoked against the 1929 registry tax on motor vehicles at 3 per cent of their value. This was rejected.

NON-RESIDENT REGULATIONS

Several states this year passed specific regulations in regard to cars of non-residents. Non-residents staying in Mississippi more than 25 days must register temporarily with the state auditor. The fee is $1.00. In South Carolina with the exception of 90 days' operation of passengers motor vehicles, non-resident corporations must be licensed, $9 for each automobile weighing not over 2,000 pounds and $3 for each additional 500 pounds. The license for trucks and trailers range from $30 to $800 with a 50 per cent reduction for pneumatic tires. Georgia and South Carolina have effected reciprocity in regard to motor buses traveling interstate. Non-resident cars running regularly in Texas must have a temporary certificate of registration with Texas. The rate is 50 cents. Vehicles used for marketing farm products are exempt.

GASOLINE TAX

Rate Stabilization.—The gasoline tax rates are becoming more stabilized. There were very few changes this year. In Idaho and Louisiana the rate was increased from 4 cents to 5 cents. In the former state the additional 1 cent is to be placed in a fund to be known as the State Highway Treasury Note Redemption Fund for repayment of the principal and interest of $1,000,000 of Treasury notes sanctioned by the 1930 Legislature. In the latter state half of the additional 1 cent tax is to go to the Education Equalizing Fund and $100,000 of the other half is to go to the Port of Lake Charles and the remainder to the Port of New Orleans. According to a 1929 law the Pennsylvania rate was reduced from 4 cents to 3 cents.

Bond Issues and Tax Rates.—The electorate of New Jersey voted its approval of a $100,000,000 bond issue which carried with it an increase in the gasoline tax from 2 cents to 3 cents. A similar amendment providing for a $10,000,000 bond issue, and an increase of the gasoline tax rate from 4 cents to 5 cents was rejected in Arizona. In Canada, the tax was increased to 5 cents in Manitoba, British Columbia and Saskatchewan, thus making a 5-cent tax on the imperial gallon universal in Canada.

Evaporation and Wastage.—During the last few years much attention has been paid to the question of evaporation and wastage. This year Kentucky and South Carolina both allow 1 per cent of the volume for evaporation and leakage. Another innovation is an allowance for a certain per cent of the tax to cover the cost of collection, Kentucky this year gives a 1 per cent allowance.

Tax Collection.—The gasoline tax has always been the most economical tax to collect and the easiest. There are only eight states that do not require dealers to have either a license or a certificate. Sixteen states require bonds. Kentucky for the first time requires a bond of all distributors, the amount is based on the estimated sales to be determined by the Tax Commission. This year Louisiana gave the dealers the privilege of filing a bond not to exceed $10,000 in lieu of immediate payment of the tax. The question of the future is the taxation of gasoline used in airplanes. The question of interstate commerce is involved. Four of the states are using the gasoline tax money derived from airplanes for airports.

Gasoline Tax Revenue.—It has been found to be true in the case of most taxes that when the rate increases the yield decreases. This has not been true of gasoline. The revenue from the gasoline tax was in 1929 $431,000,000 and from the motor vehicle registration fees, chauffeur and operators licenses, etc. $347,843,543. This is the first time that the gasoline tax revenue has exceeded the motor vehicle fee. With the exception of 2.2 per cent of the gasoline tax, all of these revenues are used for highways.

STATE GASOLINE TAX RATES

(As of December 31, 1930)

State	Cents
Alabama	4
Arizona	4
Arkansas	5
California	3
Colorado	4
Connecticut	2
Delaware	3
District of Columbia	2
Florida	6
Georgia	6
Idaho	5
Illinois	3
Indiana	4
Iowa	3
Kansas	3
Kentucky	5
Louisiana	5
Maine	4
Maryland	4
Massachusetts	2
Michigan	3
Minnesota	3
Mississippi	5
Missouri	2
Montana	5
Nebraska	4
Nevada	4
New Hampshire	4
New Jersey	3
New Mexico	5
New York	2
North Carolina	5
North Dakota	3
Ohio	4
Oklahoma	4
Oregon	4
Pennsylvania	3
Rhode Island	2
South Carolina	6
South Dakota	4
Tennessee	5
Texas	4
Utah	3½
Vermont	4
Virginia	5
Washington	3
West Virginia	4
Wisconsin	2
Wyoming	4

COGNATE SOCIETIES

BANKING AND CURRENCY

AMERICAN BANKERS ASSN., 110 East 42nd Street, New York City.

AMERICAN INSTITUTE OF BANKING, 420 Lexington Ave., New York City.

INVESTMENT BANKERS ASSN. OF AMERICA, 531 First National Bank Bldg., 33 S. Clark St., Chicago,, Ill.

INVESTORS' VIGILANCE COMMITTEE, INC., 42 Broadway, New York City.

National Assn. of Mutual Savings Banks, 11 East 36th Street, New York City.

New York Clearing House Assn., 77 Cedar St., New York City.

Private Bankers Assn., 31 Nassau Street, New York City.

United States League of Building and Loan Assns., 22 East 12th Street, Cincinnati, O.

INSURANCE

Actuarial Society of America, 256 Broadway, New York City.

American Institute of Actuaries, 720 N. Michigan Ave., Chicago, Ill.

American Institute of Marine Underwriters, 56 Beaver Street, New York City.

American Life Convention, Omaha, Neb.

American Marine Insurance Syndicate, 56 Beaver Street, New York City.

Association of Casualty & Surety Executives, 1 Park Ave., New York City.

Association of Life Insurance Presidents, 165 Broadway, New York City.

Board of Underwriters of New York, 56 Beaver Street, New York City.

Casualty Actuarial Society, 75 Fulton Street, New York City.

National Aircraft Underwriters' Assn., 1 Park Ave., New York City.

National Assn. of Life Underwriters, 11 W. 42nd Street, New York City.

National Assn. of Mutual Casualty Co.'s, 730 Fifth Ave., New York City.

National Assn. of Travelers' Aid Societies, 23 W. 43rd Street, New York City.

National Board of Fire Underwriters, 85 John Street, New York City.

National Bureau of Casualty & Surety Underwriters, 1 Park Ave., New York City.

National Council on Compensation Insurance, 151 Fifth Ave., New York City.

National Council on Workmen's Compensation Insurance, 80 Maiden Lane, New York City.

National Fire Protection Association, Boston, Mass.

Surety Association of America, 160 Broadway, New York City.

DIVISION VIII

PUBLIC RESOURCES AND UTILITIES

FEDERAL SURVEYS AND MAPS

By Joseph Henry Wheat
Secretary, Federal Board of Surveys and Maps

BOARD OF SURVEYS AND MAPS OF THE FEDERAL GOVERNMENT

Organization.—The Board of Surveys and Maps of the Federal Government was created by Executive order of Dec. 30, 1919, for the purpose of making recommendations to the several executive departments or to the President, in order to coordinate all map-making and surveying activities of the Government. Twenty-three Government services are represented on the Board.

The Advisory Council to the Board is composed of representatives from 22 associations and societies of engineers, geographers, geologists, etc., interested in surveys and maps.

The map information office of the Board was established in 1920 for the purpose of collecting, classifying, and furnishing to the public information concerning all map and survey data available in the several Government departments and from other sources.

Meetings of the Board are held on the second Tuesday in each month except June, July, and August. At these meetings, nearly all of which are open to the public, matters of general mapping interest are discussed and reports of special committees are presented and acted upon. The Board has undoubtedly exercised a strong influence in bringing about satisfactory solutions of many problems relating to surveys and maps.

MAPPING AND SURVEYING SERVICES

The Geological Survey is the most productive of the mapping organizations, as it is engaged in making the basic topographic map of the entire area of the United States. It is also engaged in making a geologic map of the United States and Alaska, involving both topographic and geologic surveys. In conducting investigations relating to surface and underground waters, classifying the public lands and supervising the engineering phases of mineral leasing, the resulting maps are incidental.

The Coast and Geodetic Survey is one of the oldest surveying bureaus of the Government. It is charged with the survey of the coasts of the United States and its possessions and with the publication of navigational charts of those regions. It is also charged with the determination of geographic positions by astronomic observations and by triangulation and traverse, and with the determination of elevations by spirit leveling, in the interior of the United States and Alaska.

The General Land Office is the oldest surveying and mapping bureau of the Government. (See American Year Book, 1929). This Bureau makes rectangular surveys of the public lands, which are published in the form of township plats. The Bureau issues annually a wall map of the United States showing the extent of the public surveys, national parks, national monuments, national forests, Indian, military, bird, and game reservations, and other useful information. It also issues maps of the 29 public-land States, and of Alaska and Hawaii.

The Hydrographic Office is charged with topographic and hydrographic surveys in foreign waters and on the high seas, and in the preparation and printing of maps and charts required in navigation on those waters.

The Corps of Engineers makes special topographic maps of areas of military importance and has made topographic maps of a few quadrangles not surveyed by the Geological Survey, besides revising some of the older topographic maps of the Geological Survey.

The Forest Service publishes general geographic maps of national forests and topographic maps of portions of them.

The Bureau of Reclamation publishes topographic maps of many of the Federal irrigation projects.

The Office of Indian Affairs has mapped portions of the Indian reservations.

The Mississippi River Commission has published a series of maps showing the profile of the river and the topography along the shores, extending from the source to the mouth of the river.

The International (Canada) Boundary Commission has published a series of topographic maps extending approximately 1 mile on each side of the United States-Canada boundary line and along the east boundary of Alaska.

The Lake Survey publishes hydrographic charts of the Great Lakes for navigational uses.

The Topography Branch of the Post Office Department compiles post-route maps for all the states, Alaska, Hawaii, the Samoan Islands, Guam, Canal Zone (Panama), Porto Rico, and the Virgin Islands. It also compiles rural free delivery maps of many of the counties in each of the states.

The Bureau of Chemistry and Soils publishes maps which show the character of the soils in the areas covered. A single soil map will usually cover the area of a county.

The Bureau of Public Roads publishes maps of the United States showing the Federal-aid system of highways and also maps of some of the states carrying more detailed information of the same character.

TRIANGULATION AND LEVELING

The plan for the standard topographic mapping of the United States calls for a complete network of triangulation based on the standard (North) American datum. The geographic position of Meade's Ranch, Nebraska, is the accepted datum for the North American Continent, as the United States, Canada, and Mexico have adopted it and have made their position adjustments to conform to it. The plan also calls for spirit level elevations based on mean sea level. The existing first and second order triangulation and leveling have generally been executed by the Coast and Geodetic Survey, but the Lake Survey has executed first-order triangulation along the shores of the Great Lakes with other connecting lines. Third-order triangulation and leveling in the interior of the country has been done by the Geological Survey and the Corps of Engineers. The Mississippi River Commission has established many third-order triangulation stations and level bench marks along the Mississippi River. The International (Canada) Boundary Commission has established numerous first-order triangulation stations to fix the boundary between the United States and Canada. Horizontal and vertical control work of this character accomplished during the past year is given in the summary of the year's work.

AERIAL PHOTOGRAPHY

Utility of Photographs.—The Geological Survey, the Coast and Geodetic Survey, the Corps of Engineers, the Hydrographic Office, and the Forest Service are particularly interested in the developments of cameras and methods to obtain greater accuracy in photographs and to facilitate their use on map work. Aerial photographs are especially valuable in standard topographic mapping, being used by the Geological Survey on this work to a large extent in compiling planimetric bases for use in the field. They are also used as an aid in making military maps of the several types required for defense, the training of troops, the practice of artillery firing, and other military activities, as well as for use in the charting of coast lines and stretches of coastal country difficult and tedious to survey by ground methods. The Air Services of the Army and Navy supply aerial photographs for use by Government agencies in mapping, but some of the work of this kind has been contracted for by commercial firms.

Types of Cameras in Photographic Mapping.—The photographs are made with especially designed roll-film cameras. These are of two kinds, single-lens and multiple-lens. Single-lens cameras are used in connection with mapping large cities and areas of comparatively flat country, more particularly where the public-land survey lines are well marked on the ground by roads and fences, which afford additional control for the adjustment of photographs taken with cameras of this type. The multiple-lens cameras employed at present in photographic mapping have many advantages, owing to the large area photographed at each exposure. These advantages are so great that they more than offset the slight indistinctness shown at the outer edges of some of the photographs. The multiple-lens cameras are constructed with either three or four lenses each. The four-lens camera may be considered a tri-lens camera to which has been fitted an additional, detachable lens unit.

Stereoscopic Mapping.—Developments in the stereoscopic use of aerial photographs have resulted in the construction of instruments by means of which the relief of the terrain is revealed in such clearness that contours may be drawn from them directly on the map with a higher degree of accuracy than can be obtained in the field by ground methods. The Geological Survey is using this method successfully in mapping country difficult to map by ordinary ground methods.

Photographic Mapping. — Base maps compiled from aerial photographs by the Geological Survey during the fiscal year ending June 30, 1930, covered a total area of 4,206 square miles. Aerial photography was also used by the Hydrographic Office during 1930 on surveys connected with hydrographic and topographic mapping. The photographs are especially valuable for information concerning details in the construction of coast charts, and the Coast Survey as well as the Hydrographic Office is using them for work of this character to great advantage. The aerial survey detachment of the Bureau of Aeronautics of the Navy completed the photographing of 8,000 square miles in Southeastern Alaska, for use by the Geological Survey, the Forest Service, and the Bureau of Public Roads on map work. The Air Corps Army, photographed 11,500 square miles of territory for use in mapping by the Geological Survey, in addition to large areas in the Mississippi Valley for the Corps of Engineers and the Mississippi River Commission.

CURRENT SURVEYS

The Geological Survey in 1930 completed topographic mapping in continental United States (exclusive of Alaska) aggregating 21,867 square miles. Of this total, 16,784 square miles represent new surveys, 3,839 square miles resurveys, and 1,244 square miles revisions. In connection with the topographic work 9,168 miles of spirit levels and 6,740 miles of transit traverses were run, and 216 triangulation stations were occupied. Surveys in Hawaii included 140 square miles of new surveys and 390 square miles of revisions.

The Coast and Geodetic Survey completed a total of 120,399 square miles of hydrographic surveys and a total of 1,913 square miles of topographic surveys in the United States, Alaska, Hawaiian Islands, and the Philippines. An area of 16,100 square miles was covered by first-order triangulation and 727 miles of first-order levels were run. Triangulation of second and third order covered 3,651 square miles.

The Corps of Engineers covered 1,200 square miles of topographic mapping in continental United States and 150 square miles in the Panama Canal Zone.

The Hydrographic Office surveyed a total area of approximately 1,591 square miles.

The Geenral Land Office made original surveys and resurveys aggregating 4,763 square miles.

The Bureau of Chemistry and Soils completed 24,561 square miles of soils surveys during the past year.

STATE GEOLOGICAL SURVEYS

By George C. Branner

State Geologist, Arkansas

GENERAL

As an aid to the development and conservation of their varied mineral resources, all but eight states maintained active geological surveys as part of their governmental structures during 1930. The expenditures of these forty surveys during the fiscal years 1930-31 amounted to approximately $1,339,859. This figure was increased by approximately $283,300 by Federal, state, county, local organizations and individuals, making the total expenditures of agencies acting through state surveys approximately $1,623,159. Approximately ninety-nine full time geologists and 396 part time geologists and otherwise technically trained men were engaged in carrying on 441 survey projects. These include geologic, topographic and soil surveys, stream gaging and miscellaneous projects. Publications for the year include 260 technical reports and maps.

BASIC GEOLOGY

Arizona continued a study of the pre-Cambrian rocks northeast of the Roosevelt Reservoir and paleontological studies of the Grand Canyon series and completed a survey of the geology of the Jerome quadrangle. California continued work on the state geological map and on the Weaverville, Searles Lake and Elizabeth Lake quadrangles, and on the geology of southwestern Mono County and of Ship, Marble and Providence Mountains. Work also was carried forward on the geology of Newberry Mountains and the San Jacinto, Sebastopol, and Duncans Mills quadrangles and northeast Madera County. A study was also made of the geology of the Hetch Hetchy aqueduct. Colorado measured sections in the pre-Cambrian, Cambrian, Ordovician, Devonian, Pennsylvanian, Mississippian, Cretaceous and Tertiary, undertook a study of the flora and fauna of the Permian and Pennsylvanian and published reports on the geology of part of the Mosquito Range, the paleontology of the Denver quadrangle and revised former work on the structure and stratigraphy of the Ouray district. Connecticut continued the study of the bedrock geology of western portion of the state and published a report on the state glacial geology.

Florida continued studies in paleontology and physiography. Georgia continued stratigraphic and igneous studies. Idaho published a report on the geology of the Seven Devils area, the Little Wood district, and the Stokes, Dolomite and Bay Horse quadrangles. Illinois carried on a study of insoluble residues and of the state Pleistocene deposits, completed stratigraphic studies of the lower Mississippian formation, continued a study of Cambrian and Ordovician strata and published a report on the Pleistocene of southern Illinois. Work was also continued on the paleontology of the Pennsylvanian and a special study was made of the Pennsylvanian foraminifera. Botanical studies of the Pennsylvanian were continued as were studies in the correlation in the Pennsylvanian in western Illinois and ostracods of the Chester, and investigations were made of the Pottsville formation and the paleontology of the Mississippian. Reports were published on the physiographic subdivisions of the area covered by the Illinoian drift in southern Illinois, on the weathered zones of the drift sheets of southern Illinois and on the larviform crinoids of the Lower Pennsylvanian of the eastern interior basin. Iowa undertook a study of glacial gravels, Illinoian and post-Illinoian glacial geology, the Devonian and Silurian rocks of the state, the Dakota sandstone, and the Kinderhook stage of Iowa. Studies were also made of the plants of the interglacial deposits.

Kansas has undertaken the study of the subsurface stratigraphy of western Kansas, the stratigraphy of the Dakota sandstone and the Pennsylvanian, the stratigraphy of the Upper Cretaceous and of the Cretaceous in western Kansas. A study is also being made of the paleontology of the Cretaceous and areal geologic studies are being made of northeastern Kansas and Ness, Hodgeman, Miami, Johnson, Geary and Riley counties. A state topographic model is being prepared and a state geologic map is being published, together with a map showing the surface features of Kansas. Bulletins on the geology of Cloud, Republic, Mitchell and Osborne counties were published. Kentucky continued studies on sedimentation, stratigraphy, paleontology and physiography. Kentucky has in press a symposium on the paleontology of Kentucky, reports on the geography of Kentucky, the geology of Smithland and Eddyville quadrangles and studies on the urban geography of Louisville and of Henderson county have been completed. Maryland continued paleontologic, stratigraphic and igneous studies. Michigan continued stratigraphic studies of the Ordovician rocks in the northern Peninsula, of the Niagaran limestone of the northern Peninsula, and of the Pennsylvanian or Pottsville formation of the southern Peninsula. A special report was prepared on the bryozoans of the Devonian rocks. The surface geology of one and one-half counties was mapped. Minesota continued stratigraphic studies. Mississippi continued studies in stratigraphy and published a report on the geological development of the Mississippi Gulf Coast and on the Paleozoic rocks of Mississippi.

Missouri continued investigations of the paleontology on the Cambro-Ordovician and Mississippian faunas and extended studies on insoluble residues and geophysical prospecting. Geological reports on the Emminence-Cardareva and the Potosi-Edge Hill quadrangles were published. A report was also published on insoluble residues as a guide to stratigraphic studies. Montana published a bulletin on the geology of the Mission, Swan and Flathead Ranges and continued studies on the correlation of the Montana pre-Cambrian. Studies were also made of the fauna of the Cambrian and pre-Cambrian rocks in western Montana.

Nebraska undertook a survey of the Pleistocene beds of the state, continued work on the correlation of the Pennsylvanian formations, began a study of the Cretaceous formations and a detailed investigation of the Pennsylvanian faunas. A bulletin on the brachiapoda is in press as is a bulletin on the correlation of the Pennsylvanian beds in the Platte and Jones Point sections.

New Jersey is studying the microscopy of insoluble residue from the Kittatinny limestone. New York continued studies of the graptolites of North America and completed a hand book on paelontology. Ohio continued work on the geology of Holmes, Adams and Highland counties and undertook a study of the Devonian corals and plant fossils of the state. Manuscripts are in press on the geology of Jefferson and Lucas counties, and on the state physiography. Oklahoma continued a study of the Simpson formation and the mapping and correlation of Pennsylvanian formations in the eastern coal fields. A study was also continued of the Permian vertebrates of western Oklahoma and also a study of the joint systems of Oklahoma in connection with techtonic movements. A bulletin on the geology and petrology of the Wichita Mountains is on the press as is a report on the micro-paleontology of the Wetumka, Wewoka and Holdenville formations. A report on foraminifera from the Atoka formation will soon be published. Pennsylvania is undertaking studies of the Mississippian, Devonian, Silurian and Ordovician stratigraphy, is studying the peneplains of the state, the recent history of the Delaware Valley between Delaware Water Gap, Easton and the Wyoming Valley and surrounding areas. A new state geological map has been completed and studies are being made of the caves of the state and of the river gravels and their interpretation. The Lancaster atlas has been published.

Tennessee is continuing a study of Mississippian stratigraphy, the Wells Creek uplift, the structure and stratigraphy of the east Tennessee zinc and lead deposits and the differentiation of the Knox dolomite. A report on the stratigraphy of the central basin of Tennessee was published. Texas published reports on the geology of Bell and Stonewall counties, on the foraminifera of the Brownwood shale and the Cisco Group and a mongraph on the geology of the Glass Mountains. Virginia continued a reconnaissance of the Virginia Piedmont, completed a study on the geology of Eagle Rock quadrangle and of the stratigraphy and structure of the Valley and Valley Ridges of Virginia. West Virginia completed a study of the geology, stratigraphy and paleontology of Pocahontas and Randolph counties and carried on similar studies of Greenbrier County. A study of the Permian of West Virginia was continued. Wisconsin continued studies on stratigraphy and paleontology. A detailed aerial and magnetic survey was completed of six townships in Sawyer, Washburn and Burnette counties and a bulletin on the geology of the Gogebic Iron Range of Wisconsin was published.

FUEL MINERALS

Oil and Gas.—Alabama completed a report on oil and gas. Arkansas began a study of the oil shales of northern Arkansas, completed a report on the stratigraphy and structure of the Gulf Coastal Plain of southern Arkansas and published a report on the oil and gas possibilities of the Paleozoic area of Arkansas. California continued their publications of summaries of oil field operations. Idaho has undertaken a study of the oil and gas possibilities of southwestern Idaho. Illinois continued work on reports covering Crawford County, the Jacksonville area, the Jersey-Green area, a study of oil field waters and a general oil report and completed a study of the Dupo oil field, the western half of Lawrence County, the Marissa-Darmstadt and Taylorville areas. Kentucky continued detailed oil and gas studies and published reports on oil and gas in the Bluegrass region, natural gas in eastern and western Kentucky and the Le Grande pool. Michigan has published the results of work on the Greater Mount Pleasant district, the Muskegon oil field, the Howell-Fowlerville anticline and the Niagaran limestone belt of the Northern Peninsula with respect to oil and gas possibilities. Missouri began the mapping of oil structures in northwest Missouri. Montana is undertaking a study of the state natural gas resources.

New York continued work on a report on the state oil and gas fields. North Dakota continued studies on oil and gas. Ohio continued work on well log correlation. Oklahoma issued thirteen different chapters of their bulletin on the oil and gas geology of Oklahoma. Pennsylvania continued a laboratory study of deep oil and gas sands, and completed a reconnaissance study of the oil and gas fields of Pennsylvania, and a detailed study of the Bradford field. South Dakota completed the mapping of 200 square miles of structure. Tennessee began work on a report on state oil and gas possibilities and completed a revision of the Sunbright oil field report. Texas published papers on the correlation of oil wells in north-central Texas and on the producing horizons in the Big Lake oil field. West Virginia continued field work on the oil and gas fields of Wetzel, Tyler, Monongalia and Marion counties and completed a report on the oil and gas fields of

Brooks, Ohio and Hancock counties.

Coal.—Alabama continued a study on coals. Illinois continued studies on the microscopy of coal and carried forward work on a general coal bulletin, completed an investigation of coal ash and published a bulletin on the research needs of the Illinois coal industry. Iowa continued studies on the state coals and published two papers on studies and analyses of Iowa coals. Kentucky completed a study of the geology of the western coal field and of cannel coals. Ohio continued studies on coal analyses and published a report on coal analyses. Oklahoma completed a cooperative study with the U. S. Geological Survey of the coal fields of eastern Oklahoma. Pennsylvania undertook studies of the status of river coal and of coal classification. South Dakota mapped about 500 square miles of coal lands and is publishing a report on state coal lands. West Virginia undertook a study of the coals of Monongalia County.

METALLIC MINERALS

Alabama completed and is publishing reports on the red iron ores of northeastern Alabama and on gold and bauxite deposits. Arizona continued work on the geology and mineral resources of the Patagonia Mountain district and published a report on manganese ore deposits. Arkansas completed a coöperative study with the U. S. Geological Survey of the zinc and lead deposits of north Arkansas and published a report on a geomagnetic survey of the bauxite region in central Arkansas. California continued studies of the underground workings in the Grass Valley district, continued the publication of reports on mining in California and published a report on the Foot Hill Copper Belt of California. Colorado continued a study of the geology of the Galena Mountain area of the Boulder County tungsten area, and of the Jamestown gold deposits, studied the Plomo gold district and the Weston Pass Cripple Creek and the Rico district and published a report on the localization of ore in schists and gneisses of the Front range, on the Climax molybdenum deposit and on the correlation of ore deposits in the Ouray-Telluride-Silverton mining region.

Idaho carried on a study of the ore deposits of the Seven Devils area, Little Wood River district, Stokes and Dolomite districts and the Bay Horse quadrangles and published a report on the ore deposits of the Clark Fork district and the Seafoam, Alder Creek, Little Smoky and Willow Creek mining districts and published coöperatively with the U. S. Geological Survey a report on the ore deposits of the Wood River region and a graphic history of metal mining in Idaho. Michigan continued a geological survey of the copper belt and published a report on the results of iron ore investigations in the west end of Marquette iron bearing range. Missouri continued a study of the Joplin mineral district. Minnesota continued studies in metalic minerals. Montana studied the ore deposits of Platte lead area and published a report on the ore deposits of the Bannock and Argenta regions. Nevada compiled data for a bulletin on "mercury in Nevada" and published a bulletin on the underground geology of the western part of the Tonopah mining district.

New Mexico undertook the study of the ore deposits of the Magdelena district and of Socorro county exclusive of the Magdalena district and also of the metal resources of the State. Oklahoma completed a study of the lead and zinc district of northeast Oklahoma. Pennsylvania published a report on the magnetite of French Creek. Tennessee published a report on the brown iron ores of the Western Highland Rim. Virginia began a study of the geology of the New River lead and zinc district and continued a study of the iron deposits of western Virginia. Wisconsin continued a detailed aerial and magnetic survey in Sawyer, Washburn, and Burnette counties.

RECLAMATION AND IRRIGATION

BY HUGH A. BROWN

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HOOVER DAM

Power Allocation.—The question of the construction of Boulder dam, now officially designated Hoover dam, and the development of the Colorado River Basin continued to hold the attention of the country, and particularly the Southwestern States, during the past year. The administration officials presented to Congress signed contracts for the purchase of power, sufficient in the opinion of the Secretary of the Interior to return the cost of construction, amounting to $165,000,000, within 50 years at 4 per cent interest. The contracts for the lease of the power privilege were signed by the United States and Los Angeles and the Southern California Edison Company, acting jointly. The city and company will operate and maintain the power plant and furnish energy to meet the requirements of allottees, as follows: Arizona, 18 per cent; Nevada, 18 per cent; Metropolitan Water District, 36 per cent; Southern California municipalities, 6 per cent; Los Angeles, 13 per cent; Southern California Edison Company, 9 per cent. The allocations are percentages of firm energy of 4,330,000,000 kilowatt-hours per year upon completion of the dam and power plant. Rates of payment for energy have been fixed at 1.63 mills per kilowatt-hour for firm energy and ½ mill per kilowatt-hour for secondary energy.

Appropriation and Construction.—An item was inserted in the Second Deficiency Bill appropriating $10,660,000 to begin work, and immediately following the approval of the bill, on July 3, 1930, by President Hoover, an order was issued by the Secretary of the Interior to Dr. Elwood Mead, Commissioner of the Bureau of Reclamation, to commence construction of Boulder dam at once. The initial appropriation is being used in the construction of a railroad from Las Vegas, Nevada, to the dam site, the building of a construction road, the layout of a townsite and water works, and following these, the commencement of construction of the cofferdams above and below the dam site and the four diversion tunnels, each 50 feet in diameter. Sept. 17, 1930, a celebration was held at Las Vegas, Nev., attended by the Secretary of the Interior, the Commissioner of Reclamation, and other prominent officials of the Federal and State Governments, the railroads, and civic organizations of the states interested, to commemorate the commencement of construction.

Change In Height of Dam.—During the year, the Colorado River Board of Engineers and Geologists, of which Major General William L. Sibert is chairman, recommended that the proposed height of the dam be increased 25 feet. This will bring the height to 727 feet, and will result in raising the surface of the river 582 feet and in increasing the capacity of the reservoir to 30,500,000 acre-feet. This recommendation for increasing the height of the dam was based solely on the desirability of more effective control of unusual floods, such as that of 1884.

FEDERAL AND PRIVATE IRRIGATION PROJECTS

Economic Survey.—The report of the special advisers, based on reports of field investigators, was issued early in the year and covered 21 projects or divisions of projects, including Federal projects, private projects aided by the Government, private districts purchasing water or power from the Government, private projects requesting aid from the Government, and several projects which had made no specific requests but which were included in the investigation for various reasons. The projects investigated represented 16 per cent of the irrigable area of all projects receiving water from the works of the bureau.

Classification.—In general, the requests from the projects were found to fall into three more or less distinct classes, namely: (1) Revision of existing repayment contracts, with or without additional Government expenditures; (2) extension of existing projects, involving in some cases entirely new divisions of projects; (3) Government assistance to private projects in financial difficulties.

Statement of Policy.—The recommendations of the special advisers were based on the following statement of policy: 1. That no extension of the period of repayment should be made by the Government which does not give reasonable assurance that the conditions causing the unsatisfactory situation can thereby be eliminated or measurably mitigated; 2. That extension of repayment to one project is in itself no ground for granting a similar extension to another; 3. That no extension should be allowed where the results would merely be of benefit to private creditors; 4. That extensions should be granted if really needed to enable the actual farmers on a project to complete the development of their farms and thus establish the earning power required for successful settlement; 5. That an extension should be granted if it will measurably increase the prospect of the ultimate return of the Government's investment; 6. That the enlargement of existing projects can be justified only if essential to the success of such projects or to meet some special need and that it should not interfere with the established 10-year program under which the Bureau of Reclamation is now operating for the completion of projects already authorized.

In passing on requests of private projects for Federal aid, the following general principles were held to apply: (a) The project should be sus-susceptible of development into an economically sound enterprise and any private obligations which would load the project with a debt the land could not carry, in addition to repaying the Government advances should be liquidated or canceled before any Federal obligation whatever is assumed; (b) The cost of rehabilitating the project, including the amount due private creditors and not liquidated or waived, should be substantially greater than that on similar private projects that have succeeded or are succeeding; (c) The Government should not take over outstanding project bonds; (d) Satifsactory provision should be made for controlling speculative increases in land values which result from the Government aid; (e) When Government aid is extended to private projects, the money advanced by the Government should bear interest; (f) The Federal Government should not enter the field of rehabilitating or otherwise extending aid to private reclamation projects in a way that will break down or supersede local effort.

State Participation.—Two other important recommendations of the special advisers are that the States should actively participate in the financial and other responsibilities for construction, settlement, operation and maintenance of the projects; and that some form of project credit agency should be established to provide long time credit at a low rate of interest to tide the settlers of small means over the first few years of changing raw land into a producing farm. Many of the recommendations of the special advisers require legislative action, and these, if approved by the Department, will be submitted to Congress for such action as may be deemed advisable.

CONSERVATION AND ADMINISTRATION OF THE PUBLIC DOMAIN

Committee.—Following President Hoover's suggestion of last year that a survey be made of the public domain, including the reclamation policy, a committee of 22 members was appointed by him, headed by James R. Garfield, of Cleveland, former Secretary of the Interior, to make a study of and report on public domain problems. The Committee also included Ray Lyman Wilbur, Secretary of the Interior, and Arthur M. Hyde, Secretary of Agriculture, ex-officio members. Dr. Hugh A. Brown, Director of Reclamation Economics, Bureau of Reclamation, is serving as Executive Secretary of the Committee. Funds to carry on the work of the Committee were provided by an appropriation of $50,000 and the Committee has been actively engaged in compiling data for the preparation of a report.

Appropriation Act.—The Appropriation Act of May 14, 1930, for the fiscal year ending June 30, 1931, together with the unexpended balances of previous appropriations, power revenues, and estimated funds to be advanced by the water users for operation and maintenance, made available $14,080,300 for reclamation, distributed as follows: Examination and surveys, $471,300; storage system, $3,900,800; canal system, $4,720,700; lateral system, $732,500; drainage system, $944,800; power system, $815,000; irrigable land survey, $26,700; telephone system, $14,000; operation and maintenance, $2,217,500; and miscellaneous, $237,000. Among the larger and more important items mentioned in the Act are $2,000,000 for continuation of construction of the storage and canal systems on the Owyhee project, Oregon-Idaho; $1,400,000 for the canal system of the Gooding division of the Minidoka project, Idaho; $1,375,000 for the storage division of the Yakima project, Washington; $1,025,000 for the canal and lateral systems of the Kittitas division of the Yakima project; $620,000 for the construction of Deadwood dam on the Payette division of the Boise project, Idaho; $523,700 for continuation of construction of the canal and lateral systems of the Vale project, Oregon; and $470,000 for the canal system of the Greenfields division of the Sun River project, Montana. Provision was also made by an appropriation of $50,000 to continue the economic work, comprising soil surveys, land classification and settlement activities.

Finances.—Owing to the default of one project in the payment of the annual installment of construction charges and small increases in delinquencies on other projects, the financial results of operations during the fiscal year were not so good as for previous fiscal years. Payments from a majority of the projects were better than in any previous year. Construction payments in the fiscal year 1930 were $3,231,522.07, a decrease of $1,156,281.73 compared with the previous year. Payments for operation and maintenance were $1,651,096.76, or $269,403.81 less than in the previous year. Total payments amounted to $4,882,628.83 compared with $6,308,314.37 in 1929, a decrease of $1,425,685.54. Income to the Bureau from all sources during the fiscal year was $9,035,508.35, or $815,930.27 less than in the previous year. The operation expense for the year was $1,786,198.65, a decrease from the previous year of $730.16. Excess of operation and maintenance expense over receipts for the period amounted to $135,101.89, compared with an excess of receipts over expense of $133,571.76 for the previous year. The amount available for construction was $11,785,000. The amount expended on construction was $8,611,400, compared with $7,898,300 the previous year. Works now under construction under the 10-year program involve an ultimate expenditure of about $80,000,000. This provides for the completion of old projects and the construction of new projects under the Reclamation Act authorized by Congress. The Boulder Canyon project is being constructed with funds and under authority separate from the Reclamation Act.

The Bureau has expended for surveys and investigations, construction, operation and maintenance, and incidental operations, $250,635,000, distributed approximately as follows:

Surveys and investigations not allocated to primary projects..	$ 3,200,000
Construction of irrigation works, etc.	203,300,000
Operation and maintenance.....	32,500,000
Incidental operations, plant and equipment, etc.	11,635,000
	$250,635,000

As the settlers refund to the Government the cost of construction and operation, the fund is replenished and money becomes available for the construction of new projects. Regular repayments are being made to the Government by 22 projects, and only 2 completed projects have not yet reached a repayment status. Accretions to the revolving fund come from the sale of public lands, the receipts from which source last year amounted to $690,563.36, and from royalties from oil leases, which last year added $2,315,509.77 to the fund.

The Revolving Fund.—Of the money that has been made available for Federal reclamation work, more than 50 per cent has come from repayments by the water users and collections from other sources. As a result of this revolving feature of the fund, approximately one-third of the work performed by the Bureau has been made possible by reason of such repayments. In other words, the Bureau has had 50 per cent more money to carry on its operations than would have been available if the revolving feature had not been in effect. During the past six fiscal years and in the future, the amounts available for expenditure have been and will be more and more dependent upon the revolving feature of the fund, owing to the decrease in accretions from the sale of public land and from royalties from oil leases.

Total Funds Available.—Total funds made available for expenditure to the end of the fiscal year 1930, since the passage of the reclamation act of June 17, 1902, are summarized in the following table:

ACCRETIONS TO THE RECLAMATION FUND TO JUNE, 1930

Public land sales	$110,322,537.76
Oil leasing receipts	38,285,947.38
Potassium Act recepits	68,296.51
Receipts under Federal Water Power Act	59,360.35
	$148,736,142.00
Special appropriations	5,493,312.35
Bond loan	20,000,000.00
Less repaid	10,000,000.00
	$ 15,493,312.35
Collections from construction, operation and maintenance, and incidental operations	91,596,996.02
Total	$255,826,450.37
Disbursements	250,635,859.94
Balance	$ 5,190,590.43

CONSTRUCTION RESULTS

Easton diversion dam on the Kittitas division of the Yakima project, Washington, and Harper diversion dam on the Vale project, Oregon, were completed. Three large storage dams were under construction, namely, Owyhee dam on the Owyhee project, Oregon-Idaho; Echo dam on the Salt Lake Basin project, Utah, and Deadwood dam on the Payette division of the Boile project, Idaho. Preliminary investigations were made of the proposed Cle Elum dam on the Yakima project, Washington, an initial appropriation for which was made available. Important canal and lateral construction was in progress on a number of projects and drainage work was continued on several others.

The total length of canals, ditches, and drains constructed to the end of the fiscal year amounted to 16,990 miles. Tunnels numbered 124, with a total length of 33½ miles. Canal structures numbered 161,469; bridges, 11,864, with a total length of 53½ miles; and culverts, 14,675, with a total length of 107½ miles. Concrete, metal, terra cotta, and wood pipe laid to the end of the fiscal year amounted to 4,279,249 linear feet, and there had been constructed 5,260 concrete, metal, and wood flumes 165 miles in length. Telephone lines totaled 4,010 miles and transmission lines, 3,204 miles. Water and steam power developed amounted to 189,348 horse-power. Excavation during the fiscal year amounted to 15,283,359 cubic yards, bringing the total excavation to the end of the year to 292,105,859 cubic yards. Riprap totaled 2,565,250 cubic yards; paving, 1,968,869 square yards; and concrete placed, 4,391,996 cubic yards.

AGRICULTURAL RESULTS

Irrigation and Crop Areas.—In 1929, the latest year for which statistics are available, the irrigated area of the Federal irrigation projects was 1,483,900 acres, an increase of 41,820 acres over that of 1928. The area cropped was 1,512,250 acres, an increase of 23,010 acres. The gross value of crops grown on these projects was $88,459,390 an increase of $7,381,640 compared with 1928. The average value of crops per acre was $58.49. In addition, the Government irrigation works furnished water under the Warren Act or other water service contracts to 1,234,230 acres, of which 1,192,990 acres were cropped, producing crops valued at $72,720,490, or $60.96 per acre. Thus the total value of crops grown on land receiving water from the works of the Bureau of Reclamation was $161,179,880, an increase over that of the preceding year of $17,606,810.

Crop Distribution.—From the standpoint of acreage, alfalfa was the leading crop grown in 1929 on the Federal irrigation projects, as has been the case for the past several years. This crop was harvested on 467,176 acres, or 31 per cent of the total cropped area of 1,512,250 acres. Cotton was again second in area with 271,282 acres, or 18 per cent of the total, followed by wheat which was grown on 144,160 acres, or 9.5 per cent of the total. Both alfalfa and cotton were grown on a larger percentage of the cropped area than in the preceding year and wheat on a smaller percentage. An increase was also noted in the percentage of the cropped area devoted to sugar beets.

Crop Values.—From the standpoint of value, cotton again stood first with a value for both lint and seed of $18,705,391, or 21.1 per cent of the total value of $88,459,390 for all crops, followed by alfalfa with a value of $15,398,048, or 17.7 per cent; garden truck, $10,454,390, or 11.8 per cent; and white potatoes, $7,733,673, or 8.7 per cent. Apples brought $6,285,626 and sugar beets, $6,850,733.

CROPPED ACREAGE AND VALUE 1929

Crop	Acreage cropped		Value		
	Total	Per cent	Total	Per cent	Per acre
Cereals	$ 319,290	21.1	$ 7,236,744	8.2	$22.66
Other grain and seed	43,692	2.9	1,345,544	1.5	30.79
Hay and forage	884,516	58.5	21,772,631	24.7	24.61
Vegetables and truck	126,598	8.4	19,925,976	22.5	157.40
Fruits and nuts	53,641	3.5	12,108,685	13.7	225.73
Sugar beets	84,183	5.5	6,850,733	7.7	81.36
Cotton lint and seed	271,282	18.0	18,705,391	21.1	68.95
Other miscellaneous	54,031	3.5	513,686	0.6	9.57
Duplicated cropped acreage	324,983	21.4	....	....	.....
Total	$1,512,250*	100.0	$88,459,390	100.0	$58.49

* The dry-farmed area of this total amounted to 92,180 acres, producing crops valued at $899,720.

Livestock and Equipment.—Livestock and equipment on the 24 operating Federal irrigation projects were valued in 1930 at $42,667,259. The inventory showed 71,080 horses, valued at $3,697,707; 10,274 mules, $902,596; 67,959 beef cattle, $3,548,450; 129,336 dairy cattle, $10,290,656; 433,895 sheep, $3,861,411; 93,095 hogs, $894,564; 2,075,831 chickens, turkeys, ducks and geese, $2,418,584; 37,405 hives of bees, $231,509; and 2,150 rabbits, $3,550. Including the value of purebred and scrub sires of beef and dairy cattle and the value of broad sows, the total value of livestock amounted to $26,420,689 and that of farm equipment to $16,246,570.

Settlement.—A tabulation of settlement and economic data on the 24 operating projects shows 39,970 irrigated farms, with a population of 157,088; 214 cities and towns, with a population of 473,073; 686 schools; 713 churches, and 130 banks, with deposits of $145,386,400 and 245,181 project and non-project depositors.

PUBLIC LAND ENTRIES

Klamath.—Twenty-four public-land farm units were opened to entry on the Tule Lake division of the Klamath project Oct. 18, 1930. Plans had been made to open this block of lands in the spring, but the preference right of 90 days accorded to ex-service men to enter public-lands lapsed on February 14, 1930, by limitation of law and, as Congress had expressed the intention of extending the right for a further period, it was deemed advisable to postpone the contemplated opening until the right was again effective or Congress had otherwise decided. The resolution extending the right for an additional 10 years from April 14, 1930, was approved on June 12, 1930. The units were opened in the fall to enable the successful applicants to prepare their land for irrigation in the Spring of 1931.

Lower Yellowstone.—A large number of settlers were brought to the Lower Yellowstone project, Montana-North Dakota, through the efforts of the Lower Yellowstone Development Association, financed largely by the Northern Pacific and Great Northern Railways and the Holly Sugar Corporation. On this project the Bureau holds options on a number of farms in private ownership which have been valued at an independent appraisal and are sold to settlers on amortized payments over a period of 20 years.

California and Wyoming.—The Southern Pacific System has devoted considerable attention to the Orland project, California, where the Bureau also holds options, and a few farms on this project were sold. Settlement of the public-land farm units on the Willwood division of the Shoshone project, Wyoming, continued slowly but steadily, with the active assistance of the Colonization department of the Burlington Railroad. Efforts to colonize the Riverton project in the same state proved largely futile, owing chiefly to lack of transportation facilities to the project lands. Early development of this project would undoubtedly follow the construction of a spur line from either the Chicago and Northwestern or the Burlington, and the erection of a beet sugar factory. The development of known oil fields near the project presages the construction of a spur line through the project in the early future.

INDIAN IRRIGATION PROJECTS

The Indian Service has developed a total of 205 irrigation projects at a cost to June 30, 1930, for construction work of $36,754,768, and for operation and maintenance, $10,998,937. The construction reimbursements have been approximately $1,416,300, and operation and maintenance reimbursements $3,753,000. The area of these projects under contructed works is 735,000 acres. The ultimate area is estimated to be 1,347,800 acres. The estimated cost to complete these projects is $30,000,000.

PUBLIC LANDS

By Charles C. Moore

Commissioner, General Land Office, Department of the Interior

WORK OF GENERAL LAND OFFICE

Disposition of Public Domain.—Outstanding in interest, in a comparison of the work of the General Land Office for the fiscal year ended June 30, 1930, with preceding years, is the fact that there has been a constant increase since 1926 in the area of land embraced in original selections, filings and entries, the figure for the past year being 5,434,550 acres as against 4,612,722 for 1929. At the close of the year there were embraced in pending unperfected entries, filings and selections 22,533,574 acres as compared with 21,347,505 acres at the close of the year 1929. Dispositions under the public land laws, coupled with numerous withdrawals for public purposes, the largest being that for the Boulder Dam reclamation project, reduced the unappropriated and unreserved public domain by approximately 11,000,000 acres, its area now being 178,979,446 acres exclusive of Alaska, located by states as shown in a table following this article.

Reports On Legislation.—During the present session of Congress the office submitted memorandum reports on 210 public and private bills affecting the public lands, of which 82 were enacted into law. Instructions necessary to carry the laws into effect were issued in 73 cases. Many other public land bills were introduced but reports not called for. Other important legislative matters having a bearing on the disposal of the public domain were taken under consideration by the Commission on the Conservation and Administration of the Public Domain, appointed by the President under authority of the Act approved April 10, 1930 (Pub. No. 107).

Receipts.—The total cash receipts from sales, leases and other disposition of public lands (including receipts from copies of records, sales of government property, etc.) were $6,492,720.20, and from sales and leases of Indian lands $308,689.75, an aggregate of $6,801,409.95, the source of which and disposition in the Treasury are shown in the following table:

Source of receipts	Disposition in the Treasury			
	General Fund	Reclamation Fund	State Funds	Total
Sales of public lands........	$ 57,762.36	$ 327,320.03	$ 13,276.35	$ 398,358.74
Fees and commissions.......	87,171.02	329,066.85	....	416,237.87
Bonuses, rentals and royalties from mineral leases.......	474,066.39	2,488,466.23	1,776,563.05	4,739,095.67
Sales of land and timber in Oregon and California railroad grant	....	....	504,642.00[1]	504,642.00
Sales of land and timber in Coos Bay wagon-road grant	228,882.59	....	76,294.20[2]	305,176.79
Sales of reclamation townsites and campsites	....	9,081.77	....	9,081.77
Sales of timber in Alaska...	4,529.79	....	....	4,529.79
Royalties on coal leases in Alaska	5,774.36	....	....	5,774.36
Rentals from fur farms in Alaska	1,705.00	....	....	1,705.00
Royalties and rentals from potash deposits	....	13,766.76	....	13,766.76
Power permits	14,836.97	....	....	14,836.97
Miscellaneous (copies of records, survey fees, sales of Government property, etc.)	79,514.48	....	....	79,514.48
Total	$954,342.96	$3,167,701.64	$2,370,775.60	$6,492,720.20
Sales and leases of Indian lands	....	....	....	308,689.75[3]
Aggregate	....	....	....	$6,801,409.95

[1] It is estimated that this amount will all be paid to certain counties in Oregon and Washington in lieu of taxes.

[2] Amount payable to Coos County 25 per cent of sales of land and timber.

[3] Of the amount received as royalty from oil lands in the bed of Red River, Oklahoma, 37½ per cent, amounting to $34,303.03, is paid to the State of Oklahoma, and the balance, amounting to $57,171.73, is credited to the Kiowa, Comanche and Apache Indians.

Expenditures.—The total expenditures for the conduct of the business of the General Land Office and its field activities, including the expenses of the district land offices, amounted to $2,222,785.

Land Entered and Patented.—The total area of public and Indian lands embraced in original entries allowed during the year was 5,434,550 acres, not including 74,442 acres embraced in public sales, timber and stone entries, mineral entries and other items. Of the total area embraced in allowed original entries, 4,125,120 acres were allowed under the Stock-raising Homestead Act of 1916. The area patented was 1,892,475 acres, including 1,433,905 acres patented under the homestead laws.

Field Service.—The field examiners investigated and reported upon 16,860 cases, of which 5,226 reports were adverse to the claimants and 11,634 were favorable. While there was a slight increase in the number of cases pending at the end of the year, this was due principally to the initiation during the closing months, of emergency investigations in the Boulder dam reservoir area and in the shale area of Colorado and Utah. There were restored to the public domain 129,438 acres, representing fraudulent entries canceled as the result of field examiners' reports, and 4,315 acres through action of the courts. Indictments were secured in 29 cases, and of the criminal cases tried 22 resulted in conviction.

MAPS AND SURVEYS

Cadastral Engineering Service.—Work on the survey of the public lands was conducted in 22 states and the Territory of Alaska. Such of these surveys and resurveys as are measured on a quantity basis aggregated 15,911 linear miles. In addition miscellaneous surveys, including work for and in coöperation with other Federal agencies, were executed in every part of the public domain. Over 1,600,000 acres of agricultural lands were surveyed and resurveyed in the various western states, principally in Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming. Coöperative surveys were executed for the Forest Service to the extent of 900,000 acres of forest land, the National Park Service, the Bureau of Reclamation, the Geological Survey, and the Biological Survey. Over 250,000 acres were surveyed or resurveyed on Indian reservations. Miscellaneous surveys were executed for the War Department, Federal Power Commission and the International Boundary Commission. There were accepted and placed on file plats representing 1,599,828 acres of original surveys, and 1,448,699 of resurveys, comprising an aggregate area of 3,048,527 acres.

New Maps.—The map of the United States, 1929 edition, has been published. The state maps of Nevada and Louisiana are in the hands of the contractor and being printed. Work is progressing upon the recompilation of the maps of Idaho and Wyoming, and the revision of the map of Wisconsin. A new map of the Hawaiian Islands was compiled and the map of the United States west of the Mississippi showing the activities of the Department of the Interior was revised, and both published during the fiscal year.

PUBLIC LAND ENTRIES AND LEASES

Homestead.—There were approved for patenting 6,727 homestead entries. Final stock-raising homestead entries to the number of 2,530, involving 1,057,262 acres, were patented. Since the passage of the Stock-raising Homestead Act 57,609 patents have been issued thereunder, covering an aggregate of 21,289,660 acres.

Mineral.—During the year 256 entries under the mining laws were patented and 917 mineral entries were received for action. Following the decision of the Supreme Court of the United States in the Krushnic case (280 U. S., 306), involving rights under oil shale placer locations antedating the Mineral Leasing Act of Feb. 25, 1920 (41 Stat., 437), action has been had on approximately 4,000 claims.

Oil and Gas.—Under the relief provisions of the Mineral Leasing Act 74 leases were granted. Under section 14 of the act, which authorizes leases to permittees who show a discovery of oil and gas as the result of prospecting under a permit, 73 leases were issued. One lease was issued under section 17 through public sale. During the year 8,358 prospecting permits were canceled.

Miscellaneous.—Sixty-eight coal prospecting permits, 29 coal leases, 15 coal licenses, 41 potash permits, 3 potash leases, and 30 sodium permits were issued.

Receipts from Mineral Leasing.—Receipts from bonuses, royalties and rentals under the law providing for the leasing of mineral rights on the public domain aggregated $4,739,095.67. The largest receipts were obtained from leasing mineral lands in Wyoming, the amount being $3,274,459.06, and in California with $1,009,373. Smaller amounts were received from lands in Montana, Colorado, Utah, North Dakota, Alabama, Louisiana, Idaho, Washington, Nevada and South Dakota in the order named. Under the terms of the law each state receives 37½ per cent of the receipts from bonuses, rentals and royalties derived from the public lands within its borders, the reclamation fund receives 52½ per cent, and the other 10 per cent is paid into the Treasury of the United States and credited to miscellaneous receipts.

Preference for Ex-service Men.

—There were opened to entry through release from segregation or withdrawal 254,567 acres, and through survey or resurvey 547,626 acres, with preference right of entry to ex-service men of the World War.

Special Leases.—Leases for public airports were issued to Rawlins, Wyoming, Milford, Utah, Ajo, Arizona, and Florence, Arizona; 177 applications for fur-farming leases in Alaska were considered and 9 leases issued, 60 applications awaiting report of field examination; 145 applications for grazing leases in Alaska were given consideration, and 80 such applications are waiting report from the field. Two applications for leases of public land in connection with mineral, medicinal or other springs are pending.

WITHDRAWALS

Recreational Areas.—Fourteen withdrawals were made for recreational classification, aggregating 258,020 acres, based on 1 municipal, 4 county, and 9 state petitions. One tract was purchased under the recreational law and 2,893 acres were classified as nonrecreational and released from withdrawal.

Grazing Lands.—For stock driveways, to expedite the movement of stock between grazing areas and to shipping points, 170,552 acres were withdrawn. The total area included in such withdrawals at the close of the year was 9,443,655 acres.

Rights of Way.—One hundred and ninety-five railroad right of way applications, and 617 irrigation and miscellaneous applications were received, in practically all of which some action was had.

RECLAMATION AND IRRIGATION

Involving land in Federal reclamation projects, action was had on 587 original homestead entries, 300 assignments were considered, and 28 desert land entries and 285 final reclamation homestead entries were approved for patenting. Since the passage of the acts of August 11, 1916, and May 15, 1922, applications by 73 state irrigation districts for approval have been received. During that period applications by 58 districts, embracing a gross area of 2,432,258 acres, have been approved, and applications by 16 districts, involving 323,408 acres, have been finally rejected. Five hundred and forty-eight desert land entries were approved and 385 canceled. There was also considerable activity under the Carey Act, providing for reclamation of arid lands under state supervision, the Pittman Act, to encourage the development of underground waters in Nevada, and the swamp land grant to the several states entitled thereto.

UNAPPROPRIATED PUBLIC LANDS

The following table shows the area, by states, of the remaining vacant, unappropriated and unreserved public lands:

	Area, in acres		
	Surveyed	Unsurveyed	Total
Arizona	8,084,880	7,096,000	15,180,880
Arkansas	190,969	....	190,969
California	11,284,395	5,339,093	16,623,488
Colorado	6,825,425	1,202,043	8,027,468
Florida	12,245	6,652	18,897
Idaho	8,765,491	1,852,479	10,617,970
Minnesota	189,845	....	189,845
Montana	6,510,937	90,740	6,601,677
Nebraska	22,628	....	22,628
Nevada	30,064,688	21,389,805	51,454,493
New Mexico	14,316,481	1,347,640	15,664,121
North Dakota	146,505	....	146,505
Oregon	12,976,725	92,411	13,069,136
South Dakota	439,880	....	439,880
Utah	12,378,068	11,503,377	23,881,445
Washington	906,382	14,202	920,584
Wyoming	15,185,722	743,738	15,929,460
Grand totals	128,301,266	50,678,180	178,979,446

PUBLIC SERVICE COMMISSIONS

By John Bauer

Director, The American Public Utilities Bureau

NEW YORK LEGISLATIVE COMMISSION

The significant event in 1930 which is likely to have far-reaching influence on commissions throughout the country, was the report of the special New York Legislative Commission which during 1929 investigated the workings of the Public Service Commission Law for the purpose of recommending changes needed for the better protection of the public interest. This commission consisted of six members from the legislature (three from the Senate and three from the Assembly) and three members appointed by Gov. Franklin D. Roosevelt. Its inquiry extended not only to the history and operations of the New York regulatory statutes, but covered also the experience elsewhere, including criticisms and proposals made by responsible students of regulation. It called a large number of witnesses, members and technical experts of the New York Public Service Commission, commissioners from other states, leaders in the public utility industries, bankers, economists, engineers and representatives of consumer groups. The investigation constituted the most complete stock-taking of regulation that has taken place since the commissions were created about 25 years ago. The commission divided into a majority and minority group—the six legislative members against the three appointed by Gov. Roosevelt. Both majority and minority agreed that the basic difficulty in the present system of regulation is the uncertain and variable rate base represented by "fair value" as defined by court decisions and administered by the commissions.

RATE REGULATION

Basis.—In fixing rates a commission must make allowance for all operating expenses, taxes, and a fair return on the fair value of the property used in service. Under the present law, however, both the "value" and "rate of return" are quantities to be separately determined in each rate proceeding, without precise principles or exact facts from which they can be ascertained. They are largely matters of opinion, and vary according to changing conditions and the weight given to particular factors and estimates. Hence, every rate investigation creates a sharp conflict of interest; the company strives for the maximum attainable value and rate of return, while the representatives of the consumers struggle for minimum sums. The evidence is presented through experts, with one group against the other, and with the result of drawn-out proceedings, cumbersome records, excessive costs, unsatisfactory decisions, and without permanent settlement of any of the disputed factors. Under these conditions, without exact standards, rate-making cannot be satisfactorily administered, the financial stability of the companies is impaired, and the commissions avoid the undertaking of systematic rate adjustments; so regulation to a large extent goes by default.

Standards.—Majority and minority were agreed that definite standards and machinery are needed to make rate regulation effective from the administrative standpoint and sound as to financial policy. To this end, they agreed that a fixed or non-variable rate base is needed for each company, also a definite rate of return. They disagreed, however, as to the legal possibilities of instituting such fixed standards, in place of present variable and uncertain ones. The minority favored the direct establishment of such exact standards through legislative action, under the administration of the Public Service Commission. As the first step, it would have all existing properties appraised and an initial valuation established for each present property, recognizing so far as necessary or reasonable, present costs and conditions. Then, the initial valuation in each instance would be placed upon the books of the company, and would not be changed thereafter; and to the amount would be added actual additional investments as made in extensions and improvements of the property. The properties would be fully maintained through repairs and adequate provisions for depreciation, and the rate base would be shown at any time as a definite figure. Likewise the rate of return would be definitely fixed. The rights of the company and the obligation of the public would thus be readily determined at any time, and rates would be promptly increased or reduced according to exact showing of facts, without dispute and litigation.

Proposal for Contract System.—The majority agreed to the general desirability of such a definite system, but believed that it could not be established through legislation. It held that the general basis of value is a matter of inherent constitutional right which cannot be modified by legislative fiat, as against the minority view that not only rate-making as a general policy, but also the standards and machinery of administration, are matters of legislative determination in the public interest, provided that investors are dealt with fairly in relation to the public interest. The majority recommended a contract system under which the state would agree with the companies for the establishment of definite rate bases and rates of return, but that these quantities could be changed periodically as the contracts expired.

Legislative Action.—Two sets of bills were presented to the legislature, to carry out respectively the majority and minority ideas. The minority bills had the endorsement of Gov. Roosevelt, but received practically no consideration by the Republican majority of the legislature. The majority bills, however, were not acceptable to the public utility companies, and were so modified as finally passed by the legislature, as to change materially the point of view expressed by the majority of the Revision Commission. The bills as passed were vetoed by the Governor as ineffectual and dangerous from the public standpoint.

THE QUESTION OF CONSUMER REPRESENTATION

The whole question of valuation and rate of return thus remains unchanged in New York as elsewhere. The discussion, however, has greatly clarified the issue throughout the country, and has produced sharply drawn lines as to policy. Apart from rate base and return, other important matters were covered by the Revision Commission. Majority and minority agreed that under present conditions, the interest of the consumers is not effectively represented; that the regulatory commissions serve largely as courts in utility cases, wherein the company side is effectively presented, while the consumer side goes largely by default, except in special instances. The majority proposed a special Public Defender in the Attorney-General's office, whose responsibility would be to present the public side without quasi-judicial responsibility. The creation of this position would explicitly recognize that the primary function of the Public Service Commission is judicial, while according to the minority view, it should be primarily representative of the public interests, and that the judicial rôle should be largely eliminated through the introduction of exact standards of rate-making. If the rate base and rate of return were thus definitely shown, rate-making would become an administrative duty, freed from all judicial qualities. Gov. Roosevelt vetoed the public defender bill, on the ground that it would further weaken the representative responsibilities of the Public Service Commission.

HOLDING COMPANY DEVELOPMENTS

The majority and minority agreed also that the effectiveness of regulation has been impaired by the rapid holding company developments in recent years. These organizations have assumed practically the management of the operating companies, and have not been subjected to state regulation. They render various kinds of services — managerial, engineering, financial, accounting, including the sale of commodities and the installation of property—all on the basis of contracts. The commission has had virtually no control over this situation, and the payments made by the operating companies have resulted in tapping off profits under the guise of operating expenses or capital charges. The majority bill as passed by the legislature requires the filing of every contract between an operating and holding company with the commission, which, after hearing, may disapprove any agreement found against the public interest. The bill was approved by Gov. Roosevelt, who, however, considered it inadequate and recommended more vigorous legislation.

FEDERAL COURTS AND STATE REGULATION

The majority and minority were further agreed that the effectiveness of regulation had been impaired also by the gradual encroachment of the Federal courts upon state regulation. When rates are once fixed by a state commission, their reasonableness is then subject to attack in the Federal courts under the fourteenth amendment of the Constitution. During the past ten years the utility companies have increasingly resorted to the federal courts, and have thus largely voided the state instrumentality of regulation. The normal procedure is the appointment of a special master, who holds hearings and builds up a new record dealing with valuation and all other matters that are involved in passing upon the reasonableness of the rates. He virtually ignores the work that had been done by the state commission, and is usually less competent because of lack of acquaintance with rate policies and the technical matters that are involved.

It has been mostly the lower Federal courts that have set aside the findings of the state commissions, and have stood as a threat to the exercise of independent judgment by the regulatory bodies. Whether actually they have rendered decisions more adverse to the public interest than would have been obtained in the state courts, there may be doubt. There is, nevertheless, natural resentment against a utility case going to the Federal court before the state jurisdiction has been fully exhausted, since it is primarily a state matter. The properties are located in the state, their franchises were granted under state law, the services are rendered in the state, and the whole subject-matter concerns the state, except that there is the final right of the company to Federal protection against confiscation of its property.

The New York legislature memorialized Congress to limit the jurisdiction of the Federal courts to appeals from the state courts and to prevent the taking of original Federal jurisdiction in any utility cases affecting rates, service or other matters of state regulation. In the meanwhile, however, a bill was passed and approved by the Governor, to take advantage of Section 2667 of the United States Judicial Code to keep jurisdiction within the state courts pending the determination of the matter under litigation.

APPROPRIATIONS

A final matter on which majority and minority were agreed, are the inadequate appropriations by the legislature for proper investigations. Under a special bill approved by the Governor, more liberal provisions are made and a special research bureau was created. The work of the commission has been materially reorganized, expedited, and made more effectual.

The questions that have been raised in New York have country-wide application, and during the past year have been discussed widely on the basis of the New York findings.

VIII. PUBLIC RESOURCES AND UTILITIES

MUNICIPAL OWNERSHIP OF UTILITIES

By H. M. Olmsted

Associate Editor, *The American City*

PUBLIC SENTIMENT

Discussion of the Issue.—After several years of widespread indifference to the question of municipal ownership, strong indications of increased sympathy with that method of dealing with public utility problems have recently developed. During these years few important additions to the ranks of municipally owned utilities have been made, and there have been many minor defections, chiefly in the field of electric light and power, hundreds of small establishments, both municipal and private, having been absorbed into the larger private systems. There have been sporadic instances of animated public discussion, aside from the continuing propaganda on both sides—the zealous, sometimes able and sometimes näive and poorly informed, efforts of public-ownership advocates, and the equally zestful and far better financed campaign of their opponents.

Election Results.—The year brought forth no large number of important concrete changes in the municipal ownership situation, and up to the fall election few positive expressions of public opinion had been made. But the most easily traceable issue on Nov. 4 was the public utility question, and in many bitterly fought contests candidates not merely favoring stricter regulation of privately owned utilities, but at least sympathetic to public ownership, were elected. While state and national utility questions were particularly at issue, it is reasonable to believe that public sentiment in municipal utility matters follows a similar trend; and in three states specific measures favorable to local public ownership were adopted. These three states were Nebraska, where there was approved at the polls a law proposed under the initiative, permitting municipalities to finance power plants and extensions thereof out of future earnings by action of the city council, while the sales of municipal plants to power companies could only be made by 60 per cent popular vote; Washington, which voted in favor of the District Power Bill, sponsored by the State Grange, authorizing the formation of public utility districts to construct and operate water works, irrigation systems and power plants; and Oregon, where a somewhat similar proposal in the form of a constitutional amendment, was adopted. Such districts could issue bonds and condemn plants and other property. These arrangements for publicly owned utilities in special areas that might include several municipalities and extend beyond county borders as well, are of particular interest, as one of the chief handicaps of municipal utilities, particularly in the electric power field, is their isolated character, effectively denying them the benefits of production on a larger scale than a single small city could offer. A. S. Goss, Manager of the Washington State Grange, is quoted as saying: "I do not look for any large number of public utility districts to be formed, but I do look for better rates, better service and a curtailment of stock watering which will be of benefit to the whole state." In the pro-company press the action in these two states has been characterized as "dealing a staggering blow to the electric utilities of Oregon and Washington."

MUNICIPAL MEASURES

San Francisco.—On the other hand, San Francisco, which has long had a general municipal ownership policy, voted to grant a 25-year franchise to the Market Street Railway Company, which furnishes the major part of the public transportation in that city, competing with the municipal street railway lines. Some of the franchises of the company have expired, and others will expire shortly; and it had been felt that the logical opportunity had arrived for combining all of the public transportation of the city under the municipal system. Both systems have been operating under a five-cent fare, and while neither has been prospering, the private system has evidently made the better financial showing, partly due to paying much lower wages to the platform employees than the municipal system pays. The municipal system has been under considerable attack by newspapers and others as being too much imbued with "politics," and presumably these charges, together with possible inconvenience that might be occasioned if the private lines could not be easily consolidated with the municipal system, aided in obtaining a favorable vote on the new franchise. It is equally plausible, however, that the very notion of unification, despite its obvious advantages, made a negative appeal to the electorate, for the idea of competition as a safeguard to the consumer is still strong. At the election Aug. 26, four bond issues totaling $68,115,000, for the purpose of enabling the city to take over the distribution systems of the Pacific Gas & Electric Co., and the Great Western Power Co. and to distribute the city's own power from the Hetch Hetchy municipal plant, were defeated by large majorities. To the proceeds of the bond issues were to have been added $17,000,000 which it was hoped would accrue from power revenues. The San Francisco Board of Supervisors and labor organizations favored the project, but it was opposed by various business interests, allied with whose opposition was presumably the natural and widespread reluctance of voters to award large capital sums to utility companies, especially such large amounts as present legal valuation and condemnation methods call for.

Boston.—The electors had before them the question of a decision regarding the ownership and operation of the public transportation system, which for over ten years has remained in the private ownership of the Boston Elevated Railway Company, but under public operation by a state board. Three propositions were submitted to the voters: return to private operation; purchase of the private properties with full public ownership and operation; and continuation of the existing method of private ownership and public operation. The latter prevailed at the polls, which throws little, if any, light upon the public attitude, other than indicating on the one hand caution against going into full public ownership, especially in view of the enormous and possibly excessive expenditures required, while at the same time it indicates unwillingness to go back to private operation.

Los Angeles.—A proposed bond issue of $13,300,000 for additional municipal power construction obtained a majority vote, but fell short of the two-thirds required for passage.

Other Cities.—The unevenness of public sentiment regarding municipal ownership may be judged from the following list in the *Electrical World* for Nov. 15, 1930: "By nearly four and a half to one the citizens of Salem, Ore., at last week's election, instructed the City Council to proceed with steps necessary to the acquisition of water from Marion Lake for municipal power purposes. Portsmouth, Ohio, last week defeated by 5,700 votes a proposal to establish a municipal electric plant to compete with the Ohio Power Company. The proposal of North Baltimore, Ohio, to build its own electric distributing system was defeated by twenty votes. . . . Floyd L. Carlisle, Chairman of the Board of the Niagara-Hudson Power Corporation, assured the Watertown, N. Y. City Council last week that the Northern New York Utilities would renew the contract for the city's surplus power which expires in a year and a half, and possibly reduce domestic rates. Mr. Carlisle asked the Councilmen to wait before putting the city's plant into the commercial lighting field, and it is thought that they will comply with his request. Voters of Terrell, Texas, have just defeated the proposal to sell their municipal light plant to the Texas Power & Light Company by 834 to 361. . . . In Oklahoma, the city of Woodward is suing to recover possession of its power plant, which, by a vote of 749 to 654, was two years ago transferred to the Light & Power Corporation of Salina, Kans. The petition charges 'fraud, corruption, and bribery,' and holds that the price, $505,000, was inadequate. Mass meetings of citizens have been held at Paris, Ky., recently, to discuss plans for a municipally owned light, power and general utilities plant. . . . A compromise has been effected in the case of the City of McKenzie *vs.* the Kentucky-Tennessee Power Company, in which the municipality sought to regain possession of its power plant. . . . The city of Goshen, Ind., has closed a contract with Fairbanks, Morse & Co., Chicago, for equipment to be placed in a municipal electric plant at a cost of $238,000. For eleven years the city, which owns its distribution system, has been buying energy from public utility companies on contract. The City Council of Richmond, Ind., recently, following much controversy, declared that it was 'through with standby service' and would develop the city-owned utility by the purchase of additional equipment. The Austin, Minn., City Council rejected an offer of the Interstate Power Company to purchase the municipal plant for approximately $1,000,000. The municipal power plant at Thief River Falls, Minn., is being enlarged by another engine, voters having approved a bond issue for the purpose. The City Council of Moberly, Mo., has authorized a survey for a proposed municipal light and power plant and distribution system."

CENSUS OF CENTRAL STATIONS

In the latter part of the year the Bureau of the Census issued its printed report on "Central Electric Light and Power Stations," as a result of the 1927 census of electrical industries, which showed that the number of municipal systems had declined since the previous census of 1922, from 2,581 to 2,198, while the number of separate commercial central-station companies had declined from 3,774 to 2,137. The proportion of total power output of all central stations that was produced by the municipal plants decrease slightly, however, to 4.5 per cent a compared with 4.7 per cent in 1922 The number of customers of municipal systems increased 29 per cent i the five years, and those of commercial systems 78 per cent. Generating capacity of municipal plants increased 60 per cent, and current sol increased 79 per cent; the corresponding figures for commercial systems are 81 per cent and 89 per cent The average revenue per kilowatt hour for municipal systems in 192 was 3.7 cents, while for commercia systems, with their large sales o wholesale power, it was 2.6 cents. Fo domestic service the average rate wit the municipal systems was 5.5 cents as against 6.9 cents for commercia systems.

WATER SUPPLY DEVELOPMENTS

The huge publicly owned water supply developments on the Pacifi Coast, notably those of Los Angeles San Francisco and the East Ba cities, are being further augmented as the result of a bond issue of $38,000,000 in Los Angeles, approved o May 20 by popular vote running i the ratio of nine to one. The majo purpose of the issue relates to bringing water from the Boulder canyo development on the Colorado River Various other purposes are served, among them the purchase of lands and water rights in Ownes Valley where there had been considerabl conflict between local residents and the Los Angeles water development, including the aqueduct, which begins there.

RAPID TRANSIT

New York continued building its new municipal lines, the mode of operation of which has not yet been decided.

Philadelphia also went ahead with extensive additions to its city-owned subway, operated by the Philadelphia Rapid Transit Co.

Chicago, in granting a unificatio franchise to the private traction company, undertook to build subways for the company to operate in connectio with its system. Purchase of the rest of the system was also made a possibility, but only as a huge new operation of municipal finance. The traction fund, long and gradually accumulated out of the company's earnings, with the idea of helping the city to purchase the system, is to be used for building and operating the subways in Chicago.

Detroit.—The Detroit municipal street railway system has suffered a heavy decline in traffic, and, with its heavy retirement charges for bonds and the purchase price, is now experiencing a deficit. The average fare (street cars and busses) is about 6¾ cents.

Seattle.—Seattle's street railway has had a continuation of financial difficulty; but traffic losses are said to be less now than in various other cities, relatively, and if the hope that the payment of the purchase price—suspended under a moratorium for 1930 and 1931—can be spread over a longer period than the ten years remaining, should materialize, the situation would be much improved. A scientific study entitled *The Cost of Municipal Operation of the Seattle Street Railway*, by H. L. Purdy, which was published late in 1929 by the University of Washington Press, reached the conclusion that "municipal management is not responsible for the financial difficulties of the street railway. The causes are to be found in extraordinary circumstances of operation and not in inherent weaknesses of civic ownership and operation."

PUBLIC OWNERSHIP OF WATER POWER

By H. M. Olmsted

Associate Editor, *The American City*

WATER POWER OWNERSHIP AND THE ELECTION

The subject of publicly owned hydro-electric power has occupied a large place in the national and some of the state legislatures, and in the public mind, for many years, and although it may be considered as partially dormant in the past year, it is expected to revive energetically in the Congressional sessions of 1931. Shrewd political observers predicted after the election of Nov. 4, 1930, that the disposition of Muscle Shoals would be made a primary concern of the short session (1930-1931), after the appropriation bills; and the new Congress, taking office March 4, 1931, contains several additional proponents of government ownership and operation of water power, while various members returned to office made a sufficient issue of that subject that they can easily interpret their reëlection as a mandate to work for public as against private hydro-electric development. The most outstanding case in this respect is that of Senator Norris, foremost champion of public ownership, against whom was waged a bitter campaign, involving conservative eastern Republican leaders. Other senators reëlected, who are thorns in the flesh of the power companies, are Walsh of Montana and Couzens of Michigan, while from Colorado comes the newly elected Senator Edward P. Costigan, "radical" Democrat, former member of U. S. Tariff Commission, and ardent critic of utility corporations. In the House the most notable case was the defeat of Representative B. Carrol Reece of Tennessee, who opposed the Norris Muscle Shoals bill and advocated leasing to private interests, and who in his campaign had the outspoken support of President Hoover. The public-utility issue was marked in various state elections, with victories by a number of candidates for governor who are at least critical of private utility companies, including Pinchot in Pennsylvania, Cross in Connecticut, La Follette in Wisconsin, Meier in Oregon, Olson in Minnesota, and others less outspoken, while Governor Roosevelt, advocate of state power development, won an overwhelming victory in New York.

HOOVER DAM

Construction.—The past year has seen the beginning of actual construction of Hoover Dam—the erstwhile Boulder Dam—following the settlement of the questions of who should construct the generating plant and how the power should be distributed. The continuing opposition of Arizona threatens to plunge the project into possibly long-drawn-out litigation, however, as that state, at the boundary of which the dam is to be constructed, feels that it has the right to a greater share of the benefits which the dam will bring about, the lion's share of which will go to the state of California, where by far the greatest immediate need exists from the standpoint of flood protection, irrigation, and power distribution.

Legal Action by Arizona.—On October 13, 1930, the Supreme Court permitted a bill of complaint to be filed by Arizona, directed against the other six Colorado basin states and the Secretary of the Interior. The defendants were given until January to file their answers. Whether the claims of Arizona will prevail to the extent of necessitating a revamping of the scheme of allocation will presumably be decided shortly thereafter. The present allocation gives 36 per cent of the power to the Metropolitan Water District of Southern California, including Los Angeles and several other cities, for pumping, 13 per cent to the Los Angeles municipal power system, 9 per cent to the Southern California Edison Co., 18 per cent to Arizona, 18 per cent to Nevada, and 6 per cent to the smaller municipalities that had filed applications. The Metropolitan Water District also has first call on all secondary power and any unused portion of the allotments to Arizona and Nevada; and any surplus not used by these three is to be shared equally by Los Angeles and the Edison Company. The latter two have signed contracts under which they will operate generating equipment to be installed and owned by the Federal Government, to which they are to pay 1.63 mills per kilowatt-hour for primary power and one-half mill for secondary power. A newly planned city is being developed at the dam by the Government.

MUSCLE SHOALS

Criticism and the Outlook.—After ten years of controversy the Muscle Shoals question is still very much alive. After the pocket veto of the Norris bill for Government operation of the Muscle Shoals plant (Wilson Dam) on the Tennessee River, which had passed both houses of Congress, no further settlement was arrived at. However, the elections have placed the proponents of Government operation in a strategic position, and it is expected that action upon the Muscle Shoals legislation will shortly be taken. Meanwhile, there has been continued criticism of the sale of a large portion of the current now being generated at the plant to the Alabama Power Company at very low rates (2 to 4 mills per kilowatt-hour) in the face of a demand from some of the nearby municipal electric systems for additional power. It has been claimed, on the other hand, that this is due to engineering difficulties rather than to any intentional discrimination in favor of private rather than municipal use.

Nitrate Controversy.—Muscle Shoals has involved two major controversies—that of nitrate production for agricultural and military use, as against power production, and that of Government operation as a question of general policy. As to the first of these, the Reece bill emanating from the House of Representatives was directed to nitrate production, under private operation, whereas Senator Norris emphasizes the power aspect. A technical dispute continues as regards the economic desirability of extensive nitrate production, under world conditions concerning the supply of other nitrogenous fertilizers.

Question of Government Operation.—But the great controversy is over Government *vs.* private generation of power, and Government operation for this purpose receives a strong impetus from the rising and widespread dissatisfaction with the present system of public regulation of power companies and utilities generally. Continued public ownership of Muscle Shoals does not seem to be seriously in question, particularly as that policy is in force at Hoover Dam; and as the latter development will be largely under public operation as well, it does not seem revolutionary to have the Government operate one other project in a far-removed section of the country. The two plants together represent a very small enterprise as compared to the entire present electric power production of the country, and it is contended that their public operation would be of value chiefly for comparative purposes, constituting an experimental variation from the prevailing pattern of power development, and possibly providing a "yardstick" to utilize in the appraisement of the operations of the power companies. However, the opposition from the spokesmen of the power companies is very great, mainly based on the doctrine that it is improper, and even positively dangerous to the well-being of the American people, for the Government to engage in undertakings that could be carried on by private enterprise. Not wholly consistent with the alarmist attitude are the further claims that the Government will fail in the experimental attempt at operation, and that the economic importance of water power as compared to modern steam generation has been greatly over-rated. Improvements in steam-electric power stations have lowered the cost of steam generation notably, but the differential between steam and water power is very largely affected by the rate of return on the great invested capital rquired for the latter, and hence the modest interest rate for public projects becomes of particular significance. There is thus a close relationship between public ownership of water power and the conservation of coal. Recent technological advances have increased the efficiency of coal utilization, but coal is still an irreplaceable natural resource; and its use in pulverized form, one of the most striking recent developments, still involves the waste of possible by-products.

FEDERAL POWER COMMISSION

Reorganization.—An important aspect of the question of public ownership of water power is the position occupied by the Federal Power Commission in the control of public sites on navigable streams. The Power Commission has been frequently in the public eye during the past year. In the first place, a fundamental reorganization of the Commission was under thoroughgoing discussion, culminating in the passage of the Couzens bill, which reconstitutes the Commission as five commissioners to be appointed by the President, with the concurrence of the Senate; whereas, heretofore, the Commission has been made up of the Secretaries of War, Agriculture and Interior, *ex-officio*. The new form of organization is a recognition of the great importance of the work under the care of the Commission, and is hoped will result in greater facilities for looking after it, as these in recent years have been claimed to be too meager for doing a thorough job. The chief objection voiced against the new plan has been the fear that a separate commission, with a large administrative and technical staff, will constitute a dangerous extension of bureaucratic tendencies.

Capital Expenditures of Licensees.—Another field of controversy concerning the activities of the Commission has been with regard to opposing viewpoints of some of its important staff members. The chief accountant of the Commission, W. V. King, who was supported by Charles A. Russell, the Commission's solicitor, has been zealous in examining the reports of the expenditures by the various corporations which have been licensed by the Commission to construct electric plants upon navigable streams, and has severely questioned many large items on the grounds that they do not represent actual expenditures. In the course of his work he came into conflict to some extent with F. E. Bonner, executive secretary of the old Commission. Close scrutiny of the capital accounts of the various licensees is, of course, a very important matter, inasmuch as the law restricts the claims of licensees in the event of recapture by the Government, after the 50-year license period, to the actual net capital expenditure incurred (plus reasonable severance damages, if any are inflicted).

A Question of Jurisdiction.—A third question that has arisen has been with respect to the authority of the Commission over non-navigable tributaries of navigable streams, there having appeared a tendency to narrow its jurisdiction, thus releasing many of the small power sites from Federal supervision.

Regulations.—A referendum of national water-power policy was taken late in 1930 by the Chamber of Commerce of the United States, among the various local commercial organizations comprising its membership. The recommendations of a committee were submitted for action, these including emphasis on state regulation, with increased facilities for that purpose, and regulation of interstate power by concurrent action of state agencies, with the Federal Power Commission to assume control in the lack of such action.

ST. LAWRENCE RIVER POWER PROJECT

Besides the Federal projects at Hoover Dam and Muscle Shoals, another power development of great public interest is that proposed for the St. Lawrence River, on the boundary between the State of New York and the Dominion of Canada. The question of how the available water power of this great stream should be developed has agitated the State of New York for many years, and, of course, involves Federal and international questions. During the past year a preliminary agreement was finally arrived at between Gov. Roosevelt of New York and his Republican opponents controlling the Legislature, and a bill was passed under which the Governor was to appoint a commission to study the situation and work out, if possible, a practicable scheme for the state generation and sale of power of the St. Lawrence; otherwise, private generation would be the alternative. After considerable delay the Governor appointed a Commission consisting of Professor Robert M. Haig, of Columbia University, as chairman, and including in addition Julius Henry Cohen, Thomas F. Conway, Frederick M. Davenport, and Samuel L. Fuller. The Commission appointed an eminent Engineering Board to report on the technical problems and cost of the development, consisting of Lieut. Gen. Edgar Jadwin, as chairman, with Silas W. H. Woodard, of New York; O. G. Thurlow, of Birmingham, Ala.; and Col. Frederick S. Green, Superintendent of Public Works for the State of New York. Shortly thereafter, Dr. John Bauer and Col. John P. Hogan were appointed to make a study and report on the question of the disposal of electric power to be generated at the power site. Numerous minor water-powers are involved in the New York situation, and a policy of public ownership of these appears likely to prevail, partly in relation to the doctrine that these should remain or become the property of the people, and partly from the practical standpoint of the tremendous difficulties of regulation when water rights as well as physical structures become private property subject to the vagaries of current valuation theory.

OWNERSHIP AND OPERATION BY CITIES

Public ownership and operation of water power by cities, of which there are many instances, including the west coast cities of Seattle, Tacoma, San Francisco and Los Angeles, and a considerable proportion of the 1,113 municipal electric systems generating electrical energy (out of a total of 2,198 municipal systems), also engages attention in various parts of the country, and considerable public attention has also been directed, through a rate war with the power company in the same section, to the first county-owned hydro-electric development on the Flint River in Crisp County, Georgia. Hydro-electric development by public utility districts, already in effect in California, has been made possible in Oregon and Washington by legislation approved by popular vote at the November election.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

Throughout the controversy regarding public water-power development runs the influence, by example, of the great and successful public enterprise carried on by the Hydro-Electric Power Commission of Ontario. The experience of this Canadian neighbor of New York State is frequently cited in the discussions of water-power policy in the latter commonwealth and in the nation generally, and has no doubt had an effect on the Pacific coast in connection with the authorization of public power districts. The importance of Ontario's accomplishments seems to be more thoroughly appreciated by the private power interests than by the American public; for the existence, across the border, of a far-flung electrical system, conferring exceptional social benefits, and based on publicly owned and operated water power, adds a potent incentive to the bitter opposition of American power companies to experiments at all similar in character in the United States.

WATER SUPPLY

By H. Burdett Cleveland

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MANAGEMENT AND CONTROL

Water Works Accounting.—The Division of Water Works Accounting and Finance, organized at the 1929 summer convention of the American Water Works Association, began to function during 1930 with considerable promise of future benefit to the water supply industry. At the St. Louis convention in June several interesting papers were read by water company officials in charge of management and accounting. Consideration of the problems of municipal water supply accounting by experts primarily concerned in good business management should greatly aid public officials.

Holding Companies.—Fewer purchases of private water supply systems by holding companies were noted during 1930, than during any one of the past five years, due in part, without doubt, to the business and financial depression. On the other hand, there has been some evidence of increased activity in the purchase of such systems by municipalities.

Reforestation.—A large majority of water companies throughout the northeastern states are definitely planning completely to reforest all idle, open areas within their watersheds. This movement has made great headway in New York, Connecticut, Massachusetts, Pennsylvania and New Jersey.

Joint Water Supply Districts.—The trend toward development of joint water supply districts and water system planning for metropolitan areas has been evidenced during the year by such action as the purchase of the holdings of the Passaic Consolidated Water Company for $13,000,000 by the Passaic Valley Water Commission formed by the cities of Paterson, Passaic and Clifton, and by the proposal of the Greater Chicago Lake Water Company to supply filtered water from Lake Michigan to 29 towns and villages in Cook County.

Cases Before Supreme Court.—Two cases involving interstate allocation of public water supply sources are now before the U. S. Supreme Court. Pennsylvania and New Jersey have sought to enjoin the development by New York City of an additional source of water supply from the Delaware river. On the application of Connecticut, hearings were held before a Special Master in the matter of preventing the diversion of water from the Swift and Ware rivers, tributary through the Chicopee river to the Connecticut river, by the water supply development proposed by the Metropolitan District (Boston) Water Supply Commission. The Recommendations of the Special Master were against the claims of Connecticut. Decisions in each of these cases will be awaited with considerable interest by water works men, since the questions involved, in their application to the granting of extra-state water supply rights, or to the adjudication of claims of other states, have been brought before the Supreme Court for the first time.

Drought Conditions.—In certain portions of the country, especially the central-eastern, deficiency in rainfall during the summer and most of the fall of 1930 was the greatest so far known or recorded in the United States, as shown by the Weather Bureau reports. In other sections, such as portions of the northwest, the district east of the southern Rockies, the southeastern states and most of the northeastern states, normal and above normal rainfall has been experienced.

CONSTRUCTION

Amount.—Municipal construction, as indicated by volume of municipal bond issues, has been about the same as during 1929. This has been the case in the special field of water supply improvements. This situation has not been to the best interests of municipalities or to the country at large since bond interest has ranged slightly below 4 per cent during 1930 as against 4½ per cent on municipal bonds during 1929; labor has been somewhat lower and materials considerably lower; amelioration of unemployment conditions has been a desired objective and the full burden of cost for needed improvements met by bond sale proceeds is not generally passed on to taxpayers within three to five years.

New Projects.—New projects authorized or planned during the year include purchase of water rights and riparian land and improvements to the Los Angeles supply, to cost $38,800,000; the Hoover dam in Boulder Canyon, Col., for flood-control, water supply and power development, will cost $165,000,000. The dam, of concrete, will be over 700 feet high and will form a reservoir eight times larger than the Assuan. The Delaware river project of New York City, authorization for which is now before the U. S. Supreme Court, will cost, it is estimated, $274,000,000 and will require 12 years for completion of the main project and 25 years for full completion. Denver is planning a 23 mile tunnel from Dillon to Grant, Col., through the Continental Divide, to divert water from the Blue river to the proposed Two Forks dam.

WATER SUPPLY TREATMENT

Water Works Manual.—It has been decided that, for the present, *Water Works Practice*, the manual of the American Water Works Association published in 1925, will not be revised but a series of monographs covering current practice and developments in water supply treatment will be published separately. In this connection it may be noted that a revision of *Standard Methods for the Examination of Water and Sewage* for the forthcoming 7th edition is now under way and will probably be completed and published by the American Public Health Association in 1932.

Processes.—No major changes in processes have been developed during the year but some of the newer reagents and some changes in methods of application of standard chemicals have been given further study and experimentation with more conclusive results. For example, the adoption of ammonia-chlorine or chloramine treatment is increasing with greater certainty as to more effective sterilization as well as removal of tastes and odors by this method. Similarly, superchlorination and dechlorination with sulphur dioxide has proven successful at a greater number of plants, while at some plants activated carbon treatment is being relied upon for removal of tastes and odors, especially when supplementary to superchlorination. The excess lime method of water softening has been given especial attention during the past year.

STREET AND HIGHWAY TRAFFIC REGULATION

By Ernest P. Goodrich
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TRAFFIC VOLUME

Increase.—During 1930, street and highway traffic increased in volume, although not at the same high rate as previously, due to the generally bad financial condition throughout the country. The growth in registration of vehicles is given in the following table.

AUTOMOBILE REGISTRATION IN THE UNITED STATES*

1921–1930

Year	*Passenger Cars*	*Motor Trucks*	*Total*	*% Increase*
1921	9,346,195	1,118,520	10.464,714	13
1922	10,864,128	1,375,725	12,239,853	17
1923	13,479,608	1,612,569	15,092,177	23
1924	15,460,649	2,134,724	17,595,373	17
1925	17,512,638	2,441,709	19,954,347	14
1926	19,237,171	2,764,222	22,001,393	10
1927	20,219,224	2,914,019	23,133,243	5
1928	21,379,125	3,113,999	24,493,124	6
1929	23,121,589	3,379,854	26,501,445	8
1930	24,200,000	3,550,000	27,750,000	5

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* From Facts and Figures of the Automobile Industry, 1930, National Automobile Chamber of Commerce, except 1930, which is estimated.

AUTOMOBILE DEATHS*

	Automobile Deaths	
	per 100,000 Population	*Cars Registered*
1921	11.5	117.5
1922	12.5	111.6
1923	14.9	108.5
1924	15.7	101.2
1925	17.0	98.4
1926	17.9	95.5
1927	19.5	100.2
1928	20.8	101.7
1929	25.7	106.7
1930	27.0	108.0

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* From Accident Facts, 1930, National Safety Council, except 1930, which is estimated.

Gasoline consumption increased from 9,437,498,000 gallons used in 1927 in the country (exclusive of Illinois, Massachusetts and New York, which has no gasoline tax) to 13,934,300 gallons in 1929, and an estimated consumption for the whole country in 1930 of over 15,000,000,000 gallons.

Automobile Ownership and Roads.—Automobile ownership continued to grow at a higher rate than did the population of the country. The total mileage of surfaced roads also increased in greater proportion than the automobile registration. According to a report of the Automobile industry, over 50,000 miles were improved in the United States during 1929, and it is estimated that fully this amount was improved during 1930.

CONGESTION AND REGULATION

Studies and Plans.—Traffic congestion continued to be a matter of first importance throughout the country and various city-wide traffic studies were made and thoroughfare plans suggested, notably the Boston Thoroughfare Plan, the Atlanta survey, the Kansas City survey, the Washington survey, the Louisville survey, and the survey made by the Regional Plan of Los Angeles. These studies made a decided contribution to the literature of street and highway traffic.

Grade Separations.—To avoid or reduce traffic congestion and accident hazards, grade separations were carried to completion, among which a most important one is the complete separation of all directions of traffic in the "Cloverleaf," used in the New Jersey State Highway System near Rahway and near Woodbridge. Another notable structure is the West Side elevated highway in New York City which was completed and opened for traffic late in the year. This elevated highway now runs from Canal Street to 23rd Street. Numerous separations of grades of streets in various municipalities were constructed. On behalf of the serious unemployment conditions several of the railroads have expedited plans for more complete separation of grades, and it is expected that these plans will be completed in 1930, for actual construction work to begin in 1931. A special scheme for the financing of grade separation of city streets was developed in the scheme for the use of the so-called "Safety-Tower" buildings, the income from which would pay for the separation. This "Safety-Tower" is built on the intersection itself. The elevated or depressed highway with its newly introduced ideas as to access, produced the suggestion of the use of the word "freeway" for such arteries.

Underground Pedestrian Concourse.—Much new construction was finished throughout the country aside from grade separation work. One of the most interesting from both a traffic and an accident prevention viewpoint is the completion of the underground pedestrian concourse in Philadelphia. This extends around City Hall and north for several blocks under North Broad Street.

Highway Projects.—An intricate system of approach roadways was prepared for the new Hudson River Bridge, and the Windsor-Detroit vehicular tunnel was opened for traffic. Many more highways were constructed with the center passing strip. Further studies of traffic planning in the matter of highway location showed that through highways were being carried around many municipalities by detours. Municipal traffic planning amplified the scheme known as the "Steadyflow System," which received much publicity.

Parking.—The question of parking has become more and more acute and various steps have been taken during the year to improve the parking situation. In Rhode Island an extensive widening of the shoulders on the highways was initiated. Various communities passed increasing stringent parking regulations. In Washington a special report was secured with reference to the whole parking situation. The stringent idea of "no parking" throughout certain municipal areas grew in general acceptance. Various states passed special laws permitting municipalities to make use of public property and even to construct special buildings for parking purposes. Such laws were passed, carrying various varieties of permission, in California, Indiana, Michigan and New York. Seattle established a public parking area on the top of its new market. The plans for the new town to be built in connection with the construction of the Hoover Dam have been made so as to provide for street parking areas with no parking permitted adjacent to the curbs. In Los Angeles it was proved that the severe restriction of parking had not diminished the total amount of traffic which entered the downtown district.

Signalling. — Improvements were made in various municipalities with reference to traffic control signalling. East Cleveland introduced the use of the split amber. New York City adopted the two-light system recommended by the American Engineering Council. The flexible progressive system was improved in various details; the reported improvement in Westchester County, for instance, was estimated at 60 per cent due to uniform traffic control. The State of New Jersey appointed a State Traffic Commission and the state law appointing this commission has taken away certain of the powers originally held by the Motor Vehicle Commission, giving them to the new commission. No elective traffic signals can be erected anywhere within the State of New Jersey without the permission of this commission. The City of Boston has appointed a Commissioner of Traffic who is a member of the Mayor's Cabinet. The Commissioner has very broad powers in making traffic regulations and employs a personnel of approximately 90 persons in his Bureau. Los Angeles and Philadelphia entered the list of cities constructively concerned in traffic relief by creating bureaus of street traffic engineering. The final code of the Committee on Signs, Signals and Markings of the American Engineering Council was adopted as official at the Third National Conference on Street and Highway Safety. A traffic officer's manual was issued by the National Safety Council in the form of a book on the Organization for street traffic control. Numerous additional companies entered the field for the manufacture and sale of traffic signal devices, one interesting example being the use of a signal belt worn by traffic officers, lights being operated from small dry batteries carried in the officers' pockets.

ACCIDENT PREVENTION

Classification.—The whole question of accident prevention was given continued study. Various specific reports were submitted besides the many articles appearing in the technical press. One report showed that the number of miles per fatality approximated 20.8 for automobiles, 270.2 for the steam railroads, and 445.0 for the street railways of the country. Aviation was credited with being 30 times as dangerous as motor traffic.

Through Streets. — Pressure was brought to eliminate so-called "play streets" because of the danger which they create. The relationship of accidents to through streets was being re-studied because of increases of accidents along them in some instances. A special report was made by the National Safety Council on through streets, and Pittsburgh made one on traffic accidents in that city.

Lighting.—An investigation of the relationship between street lighting and accidents revealed the fact that the largest percentage of accidents in relation to the amount of traffic occurred at night, the hazards during the dark hours being four times those during the day. The Mohawk Valley turnpike has installed an experimental system of improved lighting. The question of pavement reflection from street lamps was also made the basis of a study.

Highway Sidewalks.—Active steps were taken toward the construction of sidewalks along heavy travelled highways so as to reduce the pedestrian hazard.

Police Measures.—Police schools were established for the training of officers in the direction of educating the public and enforcing regulations, so as to minimize accidents. An interesting development took place in the use of photographic and engineering evidence in studying the sites of accidents to determine causes and cures. More rigid police enforcement took place in many cities.

Billboard Ban.—Much agitation was given to the subject of billboards and legal bans were placed upon them in the interest of safe traffic in New Jersey and some other areas. Incidentally, the billboard ban in New Jersey was held as an action which would enhance the beauties of the highways in the state.

TRAFFIC CONVENTIONS

Safety Codes.—A number of conventions of national and international importance were held in this country. A third National Conference on Street and Highway Safety was held in Washington, which brought together a large number of the active proponents of the enactment of safety measures. By the end of the year it was announced that over 300 municipalities had adopted the standard traffic code. Many steps were taken looking toward the improvement of the enforcement of traffic regulations.

Papers. — Exceedingly interesting papers were read with reference to traffic matters at the National Safety Annual Congress, at the American Road Builders' Association convention, and at the Sixth International Road Congress held in Washington.

Institute of Traffic Engineers.—The profession of traffic engineering was practically established as a definite profession, which thought was exemplified by the creation of the Institute of Traffic Engineers as a professional body.

MISCELLANEOUS

Technical Papers.—Besides the papers read at the conventions mentioned above much was printed in the technical press. Several technical articles were written with reference to the advantages and disadvantages of parkways, super-highways, boulevards, and freeways. New magazines were published, one at least, being devoted entirely to traffic matters.

Traffic Noises.—To make modern city life a more pleasant one the City of New York appointed a Noise Committee which did much to reduce noises, in many cases practically abolishing them. In this latter category may be listed the efforts toward completely eliminating unnecessary traffic noises, such as the blowing of sirens.

Light Trailers.—Traffic was found to have increased to some extent through the improvement of an exceptionally large number of light trailers.

Snow Removal.—Winter traffic was and will be improved through the progress being made in snow removal.

WATERWAYS AND HARBORS

By Preston King Sheldon

Lieut.-Commander, New York Junior Naval Militia

TRENDS IN WATER-BORNE COMMERCE

General.—Decrease in the commerce of waterways and harbors of the United States noted this year, when compared to the strides previously made annually in separate instances, did not seem to affect materially the general progress which had been registered over the previous period of years. The general economic trend downward was responsible for the loss in trade *via* all transportation systems, which was not appreciably felt until the last half of the calendar year 1930. While monthly figures early in the year began to indicate a slackening in trade, the final effect upon the record of the fiscal year 1930 was not enough noticeable to be regarded as serious. Ten new records were set at the Panama Canal this year ranging from the largest cargo carried to the lowest toll cost of a ton of cargo carried.

Cargo Tonnage and Tolls.—American ships numbering 2885 led those of other countries and carried about 14,500,000 tons during the fiscal year 1930 and paid more than $13,000,000 in tolls. They carried about 48 per cent of the 30,030,232 tons of cargo on all ships and paid about 49 per cent of the total tolls collected. For the calendar year 1930, a drop of 1,000,000 tons was estimated and also a drop of more than $1,000,000 in tolls. But in the fiscal year cargo showed a drop of only two per cent over the previous year. The net income from tolls for the fiscal year although less than in 1929 was greater than in any other preceding years. In 1930 the net income was $18,082,451 as against $17,729,775 in 1929. The gross tolls for 1930 were $27,077,407, a decline of $51,481 from 1929.

Panama Canal Traffic.—In the fiscal year 1930 the number of commercial transits, tolls received and quantity of cargo transiting the Panama Canal all decreased over 1929. Vessels of 24 nationalities transited the Panama Canal but more than 90 per cent of the total number of transits, net tonnage and of tolls paid were made up by seven nationalities. Great Britain was second and Germany was third. The others were Norway, Japan, Holland and Sweden. American vessels were engaged largely in coastwise trade and increased their tonnage and tolls to the end of the fiscal year. The total value of all Panama Canal trade amounts to $200,000,000 a year barring temporary economic setbacks.

Railroad Terminal Freight.—An analysis of waterway commerce shows that in the harbors and on many river fronts the terminal freight activities of the railways also enter the picture. But port activities between railheads cannot be taken into statistics as strictly affecting waterway commerce because they form part of rail movements. Yet the fact that waterways are employed to complete these connections must be used as a factor to a certain extent in determining the value of our waterways to commerce generally. The bulk of commerce over our inland waterways, however, falls into the classification of purely waterway traffic in that it is cargo carried on shipboard. The extent to which our waterways may be used for this purpose determines their real value.

RIVER AND HARBOR IMPROVEMENT

Federal Legislation.—In line with this thought, the outstanding progress this year for the development of river and harbor projects was the passing of Federal legislation under the Hoover Administration which makes possible the expenditure of about $65,000,000 a year for improvement and expansion over a period of about 15 years. Two of the largest projects favored were the taking over and operation of the New York State Barge Canal and the completion of the Illinois Waterway which is to connect the Great Lakes with the Gulf of Mexico through the Illinois and Mississippi rivers.

Fiscal Allotments.—Late in the year Major General Lytle Brown, chief of army engineers, in his annual report recommended allotments for various waterway projects for the fiscal year 1932 totalling $60,000,000 or $5,000,000 more than that recommended for the fiscal year 1931. Of the total for 1932 $36,252,470 is suggested for improvements and $23,747,530 for maintenance. The projects involved in the 1932 recommendations handled 1,299,935,928 tons of cargo and freight, for 1929 fiscal year, the last period for which complete data was ready.

GULF OF MEXICO–GREAT LAKES DEVELOPMENT

Extent of Port Connections.—Eventually the United States will be served by a network of waterways stretching over a lineal distance of 12,000 miles connecting twenty states with the Gulf of Mexico and the Great Lakes. This will give new waterway connections between New Orleans, Mobile, Memphis, Knoxville, Chattanooga, St. Louis, St. Paul, Chicago, Evansville, Cincinnati, Wheeling and Pittsburg. Many inland ports will have access to Central New York and the Atlantic Ocean through the Great Lakes and the New York State Barge Canal.

Pittsburgh Terminals.—Pittsburgh which has been a leader in all activities relating to river navigation has planned terminals on two sites. The largest is to be on the north side of the Ohio River a short distance below the Manchester Bridge and the other at Hays Station on the Monongahela River. The north side site has been selected primarily for the handling of general merchandise and package freight and will afford rail interchanges over the B. & O. R. R. The Hays station site on the Pittsburg and Lake Erie and Pennsylvania Railroads is expected to take care of switching operations on the waterfront. Another new terminal will be built at Evanston, Ill.

Tri-rivers Project.—Six counties in Ohio and Pennsylvania are concerned in a project proposed in the so-called Youngstown district which includes the Beaver, Mahoning, and Shenango rivers in a plan for their widening and deepening for slackwater navigation. They intersect three counties in Western Pennsylvania and two in Eastern Ohio. This is referred to as the Tri-rivers project and in this development would utilize existing river channels.

PORT COMMERCE AND FACILITIES

Mobile.—Forty-two steamship lines ply out of Mobile, Alabama. Of these, 17 go between Mobile and Great Britain, nine to the West Indies, Central and South America and four to the Far East. Four lines are in intercoastal trade and local companies operate two to points in Mobile Bay and neighboring rivers. The average of annual exports have been 800,000 tons. A gain of more than 100 per cent has been reported since 1919 in the total of water-borne commerce at Mobile. The annual tonnage recently approached 4,000,000.

Los Angeles.—The cargo tonnage has amounted to well over 26,000,000 a year with a value of more than $1,000,000,000. This western port has exceeded New York City in intercoastal commerce and has occupied second position among ocean ports in total commerce.

Seattle.—Nearly $800,000,000 worth of cargo through Seattle annually has been recorded in connection with figures to show that from 1918 to 1929 the commerce was nearly doubled until the tonnage was above 9,000,000. The high value of cargo at this port is annually influenced by the large volume of silk imports.

Portland, Ore., now averages about 4,000,000 tons of cargo a year, the value being more than $47,000,000.

Boston.—As high as 1,729 vessels have been entering the port of Boston in recent years, the cargo handled showing steady increases.

New York.—Harbor-freight handling craft has been increased to more than 1900 vessels. Shifts were being made this year on an increasing scale from hand to gasoline operated hoists, and the introduction of refrigerated barges was noted, a practice which immediately began to grow. More than 18,000 lineal feet of berthing space is under project at New York where about 10,000 lineal feet were finished the past two years.

Houston, Tex., has plans for doubling grain-handling facilities for export purposes.

Delaware River.—Commerce reached new high records in 1929 and at Camden, N. J., an increase of more than 100 per cent in waterway commerce was noted from 1928 to 1929 on merchandise bound for Baltimore and the South *via* the Chesapeake and Delaware Canal.

Newark, N. J., showed rapid gains as a lumber terminal since 1923, a total of more than 2,000,000,000 board feet having been recorded over the entire period to 1930.

Muskegon Harbor.—A possibility of 3,000,000 tons of cargo by 1933 was forecast this year for Muskegon Harbor, Mich., as compared with 340,000 tons in 1906. Protection was being sought from ice as the construction of breakwaters was hastened.

Brownsville.—One of the forward-looking ventures in waterway devolopment has been projected at Brownsville, Tex., where a channel 17 miles long and 25 feet deep to avoid a route of 100 miles *via* the Rio Grande has been undertaken. Brownsville was one of the most important ports during the Civil War when cotton was shipped out and medicine and ammunition was received. In reviving waterway commerce the facilities will largely be for exports. Fast fruit boats will be among the leading vessels.

WELLAND CANAL

Difficulties in dredging encountered the past year by engineers and delays in providing safety devices resulted in the postponement from Sept. 1 this year to the summer of 1931 of the opening of the new Welland Canal in Canada. Upper Lake freighters drawing up to 25 feet will be able to proceed to Prescott on the St. Lawrence River opposite Ogdensburg, N. Y. Terminal facilities were being completed this year at Prescott for transshipment of cargoes to smaller vessels. The Welland Canal will provide a waterway 277 miles long at a cost of $120,000,000 borne by the Canadian Government. The new waterway leads across the Niagara peninsula about ten miles west of Niagara Falls and overcomes a distance in level of 320 feet and will enable immense grain cargoes loaded in Upper Lakes ports to go through Lake Ontario. Removing a natural barrier it will complete a hook-up from the straits of Belle Isle up the St. Lawrence river and through the Great Lakes to the west end of Lake Superior.

ELECTRIC LIGHT AND POWER

By G. F. Wittig
Statistical Editor, *Electrical World*

GENERAL PROGRESS

Expansion In Consumption.—Unlike many other commercial and industrial activities, electric light and power service continued to expand during 1930, although at much less than the normal rate. The number of customers increased from 24,147,183 at the end of 1929 to 24,702,000 at the end of 1930. According to the Census of Electrical Industries there were 21,786,317 at the end of 1927. The installed capacity of power plants increased by 2,277,000 kw. but the energy generated during the year was nearly 1,400,000,000 kw. hrs. less than in 1929.

Industrial and Technical Developments.—The general structure of the industry underwent no essential change. It continues substantially as described in the report of the 1927 Census of Central Electric Light and Power Stations which appeared during 1930. The essential statistics had been published earlier. To the report is appended a summary of technical developments since 1912. During the intervening period there had not only been a three-fold to five-fold increase in magnitude as to generator rating, energy output, value of plant and equipment, number of employees, and revenue, as well as an expansion of service from the lighting of 16 per cent of homes in 1912 to the lighting of 63 per cent in 1927; there had been notable advances in the efficiency of utilization of fuel, resulting in the saving of millions of tons of coal; the steam turbine had completely superseded the reciprocating steam engine, the rating of the largest units had grown from 20,000 kilowatts in 1912 to 208,000 kilowatts in a machine under construction in 1927 and later put into operation; the concentration of power in individual stations had grown apace; great transmission net-works had come into existence, making possible the transfer of energy over considerable distances to meet the exigencies of loads and available power supply and limited in practice chiefly by economic considerations; these net-works, by interconnecting water-power and steam plants, contributed greatly to the economical utilization of both sources of power and during the periods of abnormally small stream flow in 1929 and 1930 aided notably in averting a "power famine" that might otherwise have occured in regions depending mainly on water-power.

Consolidation.—During the fifteen-year period, especially during the later portion, the financial structure of that portion of the industry which is privately owned, constituting about 95 per cent of the total plant capacity and energy output, the remainder being municipal undertakings, underwent a process of consolidation through the acquisition of operating properties by holding companies.

STATISTICAL SUMMARY

Operation. — Several comparisons between operations in 1929 and in 1930 have been stated. The revenue derived from electrical operations increased from $2,105,900,000 to $2,155,000,000; the investment from about $11,100,000,000 to $11,800,000,000; the energy consumption, including transmission losses, decreased from 91,421,000,000 kw. hr. to 90,076,000,000, most of the reduction being in the energy generated from water-power, which fell off from 32,390 million to 31,194 million kw. hr. while the production from fuels dropped from 59,031 million to 58,882 million kw. hr. These statistics and others in this article are quoted chiefly from the *Electrical World*, those for 1930 being in part estimated and therefore subject to minor modifications when final data are available.

Production Energy.—For the production of energy about 40,000,000 tons of coal are used annually, as well as nearly 9,000,000 barrels of fuel oil and considerably more than 100,000,000 cubic feet of natural gas.

More definitely, the quantities were: coal, 41,406,000 tons in 1929 and 39,393,000 tons in 1930; oil, 9,740,000 and 8,646,000 barrels; gas, 112,442 and 121,281 million cubic feet.

Increased Sale of Electrical Energy.—Sociologically, perhaps the most significant change was the rapid increase in the sale of electrical energy for domestic use. This increased by more than 13 per cent compared with 1929, chiefly because of more extensive use by existing consumers, for the number of these advanced but slightly; of the 29,439,000 at the end of the year the net addition had been only 471,600.

Revenue and Expenses.—Notwithstanding a decrease of some 3,000,000,000 kw. hr. in energy sales for industrial purposes—a consequence of the industrial depression and a rough measure of its magnitude, for it represents a seven per cent reduction instead of the normal ten per cent increase, or better—the larger domestic use resulted in a gain in total revenue. With it, however, came an almost proportionate rise in operating expenses. The average residential energy rate decreased during the year from 6.18 cents per kw. hr. to 6.05 cents.

NEW CONSTRUCTION

A list of new power plants or extensions completed and put into service during 1930 comes to a total of 2,789,437 kw., 2,040,957 kw. of it in fuel-burning and 748,840 kw. in water-power plants. The difference between this total and the net increase previously mentioned is essentially the equipment retired from service because of obsolescence. Capital expenditures for the increase in power equipment and the associated extensions and reconstruction of transmission and distribution facilities and service to new customers aggregated $960,000,000. At the beginning of the year, when danger of wide-spread unemployment seemed imminent, a report to President Hoover based on a survey of the industry indicated that no abatement of the construction program was contemplated and that expenditures for expansion would approach $900,000,000. This sum was exceeded.

CONSOLIDATION

Few large corporate changes took place. Although absorptions of small companies and small municipal systems were fairly numerous they occurred mainly as extensions to existing networks. The grouping of operating properties remained substantially as it had been; the changes took place chiefly within the groups by way of simplifying the corporate structures and eliminating intermediate companies, into which the smaller constituents had been combined. The drift appears to be toward state-wide operating organizations except in the larger or more populous states.

LEGISLATIVE AND LEGAL DEVELOPMENTS

The Federal Trade Commission's investigation, begun in 1929, was continued. In New York City there were hearings before the Public Service Commission during the latter part of the year relating to local rates for electric service. An element in contention is the existence of submetering companies, buying at wholesale from the power company, selling at retail to occupants of apartment houses and not under Commission control.

Muscle Shoals and Hoover Dam.—Muscle Shoals is still in *status quo.* Actual work was started at the site of Hoover Dam—formerly called Boulder Dam—on the Colorado River, prepatory to the construction of the dam itself. These are both government undertakings. As power sources, both are competitive with fuel, or complementary to fuel-burning plants, depending on the disposal of the energy ultimately to be determined; that is, whether they shall be operated independently or the energy fed into the existing transmission and distribution systems of utility corporations.

TECHNICAL PROGRESS

Steam plant operation at a boiler pressure of 1,200 pounds per square inch has become definitely established. At least two plants using that pressure exclusively were in service by the end of the year.

Average fuel consumption of all utility plants in the country decreased from 1.69 lb. of coal per kilowatt-hour generated in 1929 to 1.63 lb in 1930. In 1919 it was 3.2 lb.

Mercury Vapor Turbine.—The combination of a turbine driven by vapor from boiling mercury with others operated by steam has continued in use and shows an economy equivalent to the use of only 0.9 lb. of coal per kw. hr.

Floating Power Plant.—A 20,000 kw. floating power plant in a converted steamship went into service in New England, and is to be towed wherever it may be needed to supplement the available power supply.

GROWTH OF ELECTRIC LIGHT AND POWER

Year	Generator Rating Thousands Kw.	Energy Generated Millions Kw. hrs.	Revenue for Electric Service Millions of Dollars	Customers
1907	2,709	5,862	170	1,947
1912	5,165	11,569	287	3,838
1917	8,994	25,438	502	7,179
1922	14,313	43,560	1,020	12,710
1927	25,811	74,686	1,803	21,790
1928	27,698	82,927	1,942	23,220
1929	29,558	91,421	2,106	24,147
1930*	31,836	90,076	2,155	24,702

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* Statistics for 1930 are partly estimated.

COGNATE SOCIETIES

AMERICAN WATER WORKS ASSN., 29 W. 39th Street, New York City.

INTERNATIONAL ASSN. OF FIRE CHIEFS, Police Headquarters, Philadelphia, Pa.

NATIONAL ELECTRIC LIGHT ASSN., 420 Lexington Ave., New York City.

NATIONAL PARKS ASSN., 1512 H St. N. W., Washington, D. C.

NATIONAL PUBLIC SERVICE ASSN., 87 Nassau Street, New York City.

PARKS AND PLAYGROUNDS ASSN. OF NEW YORK, 1123 Broadway, New York City.

DIVISION IX

DEFENSE AND ARMAMENTS

MILITARY PROBLEMS OF THE UNITED STATES

By Robert S. Thomas

Chief Clerk, Historical Section, Army War College

WAR DEPARTMENT AND ARMY ACTIVITIES

The War Department and the Army of the United States covers a wide field of varied activities. Pertinent problems exterior to the main problem of proper defense for the country arise in the supervision of rivers and harbors, flood control, insular possessions, and the like. Some of these are here briefly reviewed.

Porto Rico.—The insular possessions of the United States at present subject to the jurisdiction of the War Department are the Philippine Islands and Porto Rico. Both the fiscal year 1929-30 and the preceding year, in which the hurricane occurred, were abnormal in difficulties in Porto Rican administration as regards public health, public education, public finances, and general economic conditions. However, steady progress has been made towards complete rehabilitation. An especially interesting experiment is being made in developing a special type of consolidated vocational rural school with particular emphasis placed upon practical agricultural instruction. An important change in local government is planned by which the number of municipal governments,—77—in Porto Rico will be materially reduced with attendant simplification in administration and economy in appropriations.

Philippine Islands.—One of the most difficult problems confronting the government is the satisfactory disposition of public lands and utilization of these properties in a productive manner. An experiment is being tried in Mindanao of permitting a corporation organized for the cultivation of pineapples to take up land and finance homesteaders who will settle in the colony and raise pineapples.

MISSISSIPPI FLOOD CONTROL

The flood-control project for the alluvial valley of the Mississippi, adopted by Congress in 1928, has been prosecuted vigorously within the limits of available funds. Because of legal controversy which has arisen over flowage in the flood ways west of the river in Louisiana and Arkansas, operations in these areas have not been pushed. The Chief of Engineers has been directed to review the entire subject in an effort to iron out this difficulty, taking advantage of the experience gained in the two years' work already accomplished. The $30,000,000 appropriated for the fiscal year 1930 was expended or obligated during that year. Contracts have been made for most of the work in connection with the Birds Point-New Madrid Floodway, the Bonnet Carre Spillway, and about half of the survey work necessary for flood-control on tributaries of the Mississippi. For the fiscal year 1931, Congress has made available $35,400,000 which will be spent on levee and revetment work on the main river, for work on the set-back levee of the Birds Point-New Madrid Floodway, for work on the Bonnet Carre Spilway, as well as for dredging and construction work for the navigable channel.

RIVERS AND HARBORS

The policy of improving the rivers and harbors of the United States was inaugurated by Congress in 1824 and work has continued since that time under the direction of the Corps of Engineers. During the past fiscal year, 930 authorized projects were in course of work. This total included 50 canals and waterways and the flood-control projects for the Mississippi River and its tributaries. In addition, work was authorized on 175 projects, now being modified or initiated, at an estimated cost of $146,000,000. The decided increase in expenditures for river and harbor work has been due to speeding up of operations to meet the demands of expanding commerce, and, in a measure, to assist in alleviating conditions of unemployment.

NICARAGUAN INTEROCEANIC CANAL SURVEY

On March 2, 1929, Congress authorized a survey for an inter-oceanic canal across the Republic of Nicaragua. This survey is being made by the 29th Engineers, assisted by troops from the 1st and 11th Engineers. The operations include extending and checking the topographical surveys made 30 years ago, resurveying the harbors, collecting additional hydrographic data, and making such subsurface explorations as are necessary to determine the best alignment and location for necessary construction work. The dimensions of the canal to be built as a result of this survey will be much increased over those planned in 1901 since it is proposed to handle the larger commercial vessels and increased traffic of today and that which may be anticipated in the future.

AIR SERVICE

The Air Corps gains but slowly in commissioned strength both because of the high rate of attrition within the Corps and because of present limitations to the total commissioned strength of the Army. To complete the third increment of the Air Corps five-year program, it was necessary to bring approximately 1900 men into the Corps. To secure these men, five battalions of Infantry were made inactive, as well as most of one regiment of Field Artillery. It is obvious that, if the policy of building up the enlisted strength of the Air Corps by transfer from the other arms is continued, the Army will soon be unable to perform properly its many missions. It will be necessary either to stop the depletion of other arms or to reorganize our program of national defence with a view to a change in the assignment of missions to the Regular Army.

Anti-Aircraft Artillery. — During the past four years, very creditable progress has been achieved in the technical and tactical development of anti-aircraft artillery. Three arms, the Ordnance Department, the Air Corps, and the Coast Artillery Corps have made this possible by their splendid coöperation. Anti-aircraft defense must keep pace with the development of aircraft and air tactics, for anti-aircraft artillery bears the same relation to the Air Corps as harbor defenses do to the Navy. It is essential that still further development be sought in this field so that, under combat conditions, the Air Corps will be free to act on the offensive, leaving defense to the anti-aircraft artillery.

WAR SUPPLIES

A large number of items essential to successful military operations cannot be obtained during the early months of warfare either from commercial stocks or by production. At the close of the World War, this country had on hand large stocks of many items of war supplies and equipment. In the interests of economy, free issues of equipment were made to all Army components during the years immediately following the war. Large quantities were also disposed of by sale and the money realized was turned into the Treasury. Knowing that this policy would eventually wipe out all reserves of supplies, an effort has been made during the past ten years to accumulate and maintain adequate war reserve stocks of many essential items. However, each year has witnessed depletion of these stocks by deterioration and by budgetary limitations and the situation is such now that it will be but a matter of several years when there will be no properly balanced war reserve stocks on hand for immediate issue to mobilized man-power.

ORGANIZED RESERVES

While the Regular Army and the National Guard have a distinct function both in peace and in war, the Organized Reserves are not so situated. Theirs is an organization wholly organized and trained for an emergency. The essential peace-time need of the Organized Reserves is, therefore, unit training. With a view to providing Reserve officers with practical command training, the experiment was tried of having Reserve units conduct citizens' military training camps. It was proved to be of primary value to junior Reserve officers and of secondary value to Reserve field officers. Further trial of this method will be made. To obtain higher standards of efficiency throughout the Officers' Reserve Corps, the method of promotion through credit for hours of work is gradually being abolished and in its place qualification by examination is being substituted.

PAY SCHEDULES

Except for the slight relief afforded by the Pay Act of 1922, the pay of the Army has remained practically unchanged since 1908. During that period, living costs have steadily mounted. A Regular Army officer is committed to certain standards and he is considerably embarrassed under existing economic conditions in meeting the exacting requirements imposed upon him. This is particularly true among officers of junior grade. All departments of the Government, except the uniformed services, have enjoyed material increases in pay over the 1908 scale, and the Army looks to Congress for the adjustment of pay schedules in such a manner as will make compensation commensurate with the professional attainments required of the officer.

MECHANIZATION AND MOTORIZATION

Definitions. — Mechanization and motorization are comparatively new terms in military usage. Mechanization means the use of motor-driven armored fighting machines, such as tanks and armored cars; motorization means the use of motor vehicles for the transportation of troops and supplies. A motorized unit normally dismounts to fight on foot, and sends practically all of its vehicles to a protected rear area. Thus motorization implies rapid transportation, whereas mechanization involves the use of motor vehicles for transportation and combat. Developments in these fields are significant from the general military viewpoint because of their far-reaching influence on strategy and tactics. From the American viewpoint, they are particularly significant because the United States controls more than 80 per cent of the world's automotive industry.

Aims.—The purpose of mechanization is to provide ground troops with an offensive element that can operate effectively on the battlefield in spite of aircraft, chemical agents, and machine guns. Since the World War, all armies have greatly increased the proportion of automatic small arms in their infantry and cavalry units, and technical progress has augmented the potential combat uses of aircraft and chemical agents. To counteract, in some measure, these developments, and to restore mobility to troops on the battlefield, armies are turning to fighting machines. The purpose of motorization is to substitute motor power for the physical endurance of man and beast in operations that do not require close contact with the enemy. The vehicles employed provide transportation, but lack offensive combat power.

Development.—In the American Army, motor vehicles were first extensively used for the transportation of supplies in 1916 in the Mexican Punitive Expedition that followed Villa into northern Chihuahua. During the World War, motor vehicles in vast numbers were used in moving both supplies and troops. Since the war, units of all arms and services have conducted experimental tests of motor equipment. The lack of funds for modern machines has hindered progress; but a few units, notably the 34th Infantry at Fort Eustis, Va., now have some up-to-date machines.

Experimental work on American armored cars was started in 1916-17, but only six or seven cars were produced. The armored car project was dropped during the war because other needs of the Allies were more pressing. After a lapse of ten years, development work was resumed. The Ordnance Department and the Cavalry, working together, have made rapid progress in improving their plans for light and medium type armored cars.

Though tanks had been successfully used on the Western Front before we entered the war, we had no data on which to base production of these machines in 1917. American Tank Battalions were equipped with French and British machines. After many delays, production of American-made tanks got under way; and had the war continued into 1919, our troops would have had some 4,400 American tanks ready for action. Production contracts were liquidated shortly after the Armistice, so that only 100 heavy tanks and about 900 light tanks were actually completed. These twelve-year old machines are now the standard equipment of our tank units.

New tanks ranging in weight from 8 to 25 tons have been designed and produced by the Ordnance Department. The most promising American light tank is one invented and built by Mr. J. W. Christie. This machine operates either on wheels or caterpillar trucks. An experimental unarmored model, on wheels, attained the remarkable speed of 70 miles an hour on a concrete road; and then, putting on caterpillar tracks, attained 42 miles an hour across country. Mr. Christie is now working on a fully armored machine which should be ready for test early in 1931.

Mechanized Force.—In the summer of 1928, an Experimental Mechanized Force was assembled at Fort George G. Meade, Maryland, where it operated for about three months. It included light tanks, heavy tanks, infantry, field artillery, anti-aircraft artillery, engineers, chemical warfare troops, a signal unit, armored cars, repair units, and an ammunition train. All except the tank units were motorized rather than mechanized, and most of the motor equipment was ten years old; consequently, tactical exercises were necessarily restricted. The experiment was valuable in that it clearly demonstrated the inadequacy of existing equipment, and stimulated thought on the proper organization and equipment for a mechanized force.

In the fall of 1930 a permanent Mechanized Force consisting of 35 officers and 600 men was assembled at Fort Eustis, Va., where it is in close touch with motorized elements of the 34th Infantry. Pending the development and purchase of suitable combat vehicles, the best equipment now available is being furnished. The training of individuals, units, and the force as a whole is progressing energetically and careful studies are being made on such subjects as organization, equipment, supply, command, communications and tactics of a mechanized force. It is interesting to note that a distinguished Cavalry officer, Col. Daniel Van Voorhis, was selected to command the force and that Major S. E. Brett, Infantry, an experienced Tank Corps officer, has been assigned as executive. As the Mechanized Force is the only unit of its kind in our Army, its development during 1931 will merit close attention.

PROCUREMENT OF WAR MATERIAL

This topic is occuping the attention of the Army to a considerable degree. In the report of the retiring Chief of Staff, General C. P. Summerall, the following opinions were set forth and they epitomize certain phases of the problem: "It is believed that for the best interests of our national defense, far too much of our war material is being produced by our supply departments and that the preparedness of our infantry to meet the demands of war would be greatly advanced by the transfer to it of much of the production now carried out by our depots and arsenals. Our extensive system of production in our major supply departments is an inheritance from the period when our industry was not sufficiently developed to meet our war needs and special plants for the production of military equipment and material were necessary. A system of production under which the supply departments would become for the most part bureaus of design with supervision of procurement would be for the best interests of the service and the national defense."

ORGANIZATION OF THE ARMY

By Robert S. Thomas

Chief Clerk, Historical Section, Army War College

THE WAR DEPARTMENT

The War Department, the managing agency of the Army of the United States, is presided over by the Secretary of War, a civilian answerable directly to the President. The Secretary (Patrick J. Hurley) is assisted by the Chief of Staff (General Charles P. Summerall to Nov. 20, 1930; General Douglas MacArthur since that date) who oversees the military functions; by the Assistant Secretary (Frederick H. Payne) who has charge of the supply, real estate, and war industrial plans; and by another Assistant (F. Trubee Davidson) who is responsible for Military Aeronautics. Under this combined direction operate the General Staff and the various arms and branches of the Army. The chiefs of these several arms and branches transmit advice to the Secretary of War and the Assistant Secretaries through the Chief of Staff and the Deputy Chief of Staff (Major General Briant H. Wells to March 3, 1930; Major General Preston Brown to Oct. 11, 1930; Major General E. E. Booth to Dec. 21, 1930; and Major General George V. H. Moseley since that date).

THE GENERAL STAFF

Composition and Duties. — The General Staff is composed of officers who are selected from all arms and branches of the Army, and, who are developed by long training and schooling to comprehend every side of the general problems studied by them. From these studies, they are required to present their superiors' broad and impartial conclusions for the best interests of the service. On the other hand, the chiefs of the combatant branches and supply and administrative departments are specialists whose force is trained to give technical and specific advice to the Secretary of War through the Chief of Staff concerning the particular conditions which confront the individual branches.

None of the officers of the General Staff or heads of arms or departments enjoys the right to command. The duties of each are advisory, supervisory, or administrative. The chain of command is direct from the President of the United States in the Corps Area Commanders in the manner of manipulation of the Army of the United States. The Secretary of War, however, may give orders in the name of the President to the nine areas of control in the United States proper and to the three other areas beyond the continental limits.

Command Divisions.—The General Staff consists of five Divisions, composed of officers of the Regular Army, National Guard, and Organized Reserves. The G-1 Division (Brig. Gen. Albert J. Bowley, Assistant Chief of Staff, G-1) is concerned with personnel, the man-power of the Army and nation. The G-2 Division (Brig. Gen. Stanley H. Ford; succeeded in turn by Col. Robert C. Foy and Col. Alfred T. Smith, Assistant Chief of

Staff, G-2) is concerned with worldwide information, collecting, evaluating, and treating it much in the same manner as expert historians. The G-3 Division (Brig. Gen. Edward L. King, Assistant Chief of Staff, G-3) is concerned with the operations and training of the Army. The G-4 Division (Maj. Gen. E. E. Booth, succeeded in turn by Col. Chas. F. Humphrey, Jr., and Brig. Gen. Robert E. Callan, Assistant Chief of Staff, G-4) is concerned with the housing and maintenance of the Army. The War Plans Division (Brig. Gen. George S. Simonds, Assistant Chief of Staff, W. P. D.) is concerned with plans for adequate national defense, both at home and in our island possessions.

ADVISORY BODIES

Combatant.—Other advisory bodies for the Secretary are the officers of the chiefs of the combatant arms and heads of departments and services. The combatant branches are: the Infantry (Maj. Gen. Stephen O. Fuqua, Chief); the Cavalry (Maj. Gen. Herbert B. Crosby; succeeded by Maj. Gen. Guy V. Henry, Chief); the Field Artillery (Maj. Gen. Harry G. Bishop, Chief); the Coast Artillery (Maj. Gen. John W. Gulick, Chief); the Air Corps (Maj. Gen. James E. Fechét, Chief; the Corps of Engineers (Maj. Gen. Lytle Brown, Chief); the Signal Corps (Maj. Gen. George S. Gibbs, Chief).

Non-Combatant. — The non-combatant branches are: The Adjutant General's Department (Maj. Gen. Charles H. Bridges, the Adjutant General); the Inspector General's Department (Maj. Gen. William C. Rivers; succeeded by Maj. Gen. Hugh A. Drum, the Inspector General); the Judge Advocate General's Department (Maj. Gen. Edward A. Kreger, the Judge Advocate General); the Quartermaster Corps (Maj. Gen. Frank B. Cheatham; succeeded by Maj. Gen. John L. DeWitt, the Quartermaster General); the Finance Department (Maj. Gen. Roderick L. Carmichael, Chief); the Medical Department (Maj. Gen. Merritte W. Ireland, the Surgeon General); the Ordnance Department (Maj. Gen. Clarence C. Williams; succeeded by Maj. Gen. Samuel Hof, Chief); the Chemical Warfare Service (Maj. Gen. Harry L. Gilchrist, Chief); the Bureau of Insular Affairs (Brig. Gen. Francis LeJ. Parker, Chief; and the Militia Bureau * (Maj. Gen. William G. Everson, Chief).

CORPS AREAS AND DEPARTMENTS

For command and control, the United States and its possessions are divided into Corps Areas and Departments as follows: First Corps Area, including Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, commanded by Maj. Gen. Preston Brown, succeeded in turn by Brig. Gen. Meriwether L. Walker and Maj. Gen. Fox Conner; Second Corps Area, including New York, New Jersey, Delaware, and Porto Rico, by Maj. Gen. Hanson E. Ely; Third Corps Area, including Pennsylvania, Maryland, Virginia, and District of Columbia, by Maj. Gen. Fred W. Sladen; Fourth Corps Area, including North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, and Louisiana, by Maj. Gen. Frank R. McCoy; Fifth Corps Area, including Ohio, West Virginia, Indiana, and Kentucky, by Maj. Gen. Dennis E. Nolan; Sixth Corps Area, including Illinois, Michigan, Wisconsin, Jefferson Barracks, and Arcadia Target Range, Missouri, by Maj. Gen. Frank Parker; Seventh Corps Area, including Missouri (Arcadia Range excepted), Kansas, Arkansas, Iowa, Nebraska, Minnesota, North Dakota, and South Dakota, by Maj. Gen. Johnson Hagood; Eighth Corps Area, including Texas, Oklahoma, Colorado, New Mexico, and Arizona, by Maj. Gen. William Lassiter, succeeded by Maj. Gen. Edwin B. Winans; Ninth Corps Area, including Washington, Oregon, Idaho, Montana, Wyoming, Utah, Nevada, California, and Alaska, by Maj. Gen. John L. Hines, succeeded in turn by Maj. Gen. Douglas MacArthur and Maj. Gen. Malin

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* Although the National Guard is, of course, a combat organization, the Militia Bureau is here properly listed under the heading "Non-Combatant."

Craig; the Hawaiian Department, by Maj. Gen. Fox Conner, succeeded by Maj. Gen. William Lassiter; the Philippine Department, by Maj. Gen. Douglas MacArthur, succeeded by Baj. Gen. John L. Hines; and the Panama Canal Department, by Maj. Gen. Malin Craig, succeeded in turn by Maj. Gen. George LeR. Irwin and Maj. Gen. Preston Brown. These areas and departments are subdivided into tactical divisions and brigades.

OTHER DEPARTMENTS

Directly under the supervision of the Secretary of War, but not belonging to the Army, come the activities of Insular Affairs, Panama Canal, Inland and Coastwise Waterways, River and Harbor improvements, and other civil work, such as administrative duties in the District of Columbia, largely performed by members of the Army personnel.

ARMY STRENGTH

The strength of the Army of the United States on June 30, 1930 was; Organized Reserves, 113,523 officers (including 11,606 who held commissions in both the National Guard and the Reserve Corps) and 3,323 enlisted men; National Guard, 12,732 officers, 198 warrant officers, and 169,785 enlisted men; Regular Army, 12,255 officers (including 95 Philippine Scout), 1,089 warrant officers, and 124,301 enlisted men (including 6,480 Philippine Scouts).

TABLE SHOWING THE STRENGTH OF THE REGULAR ARMY BY CORPS AREAS

Corps area, department, or country	July, 1929			June, 1930		
	Officers	Warrant officers	Enlisted men	Officers	Warrant officers	Enlisted men
First Corps Area...........	512	66	4,319	439	64	4,165
Second Corps Area[1]........	1,151	126	11,128	1,081	120	11,368
Third Corps Area..........	2,034	154	12,559	2,039	151	13,316
Fourth Corps Area.........	1,048	84	10,535	1,040	85	9,993
Fifth Corps Area...........	488	81	3,596	494	75	3,218
Sixth Corps Area...........	576	61	5,497	594	58	5,469
Seventh Corps Area........	1,003	79	8,093	1,017	78	7,707
Eighth Corps Area.........	1,842	146	21,603	1,788	141	20,762
Ninth Corps Area[2].........	1,112	149	11,546	1,085	139	11,225
Total in continental United States	9,766	946	88,876	9,577	911	87,223
Hawaiian Department	651	57	13,165	716	59	14,380
Panama Canal Department[3].	366	45	8,260	386	46	8,870
Alaska	12	3	292	9	1	305
Porto Rico	65	4	1,112	63	5	1,030
Philippine Department:						
Regular Army	506	75	4,137	518	61	4,111
Philippine Scouts	74	...	6,469	62	...	6,480
China	51	2	939	58	2	948
Nicaragua	....	....	....	26	....	254
Japan	.....	1	.....	....	1	....
Europe[4]	3	3	....	34	3	....
Miscellaneous[5]	670	....	772	806	....	700
Grand total[6]	12.164	1,136	124,022	12,255	1,089	124,301

[1] Excludes Porto Rico.

[2] Excludes Alaska.

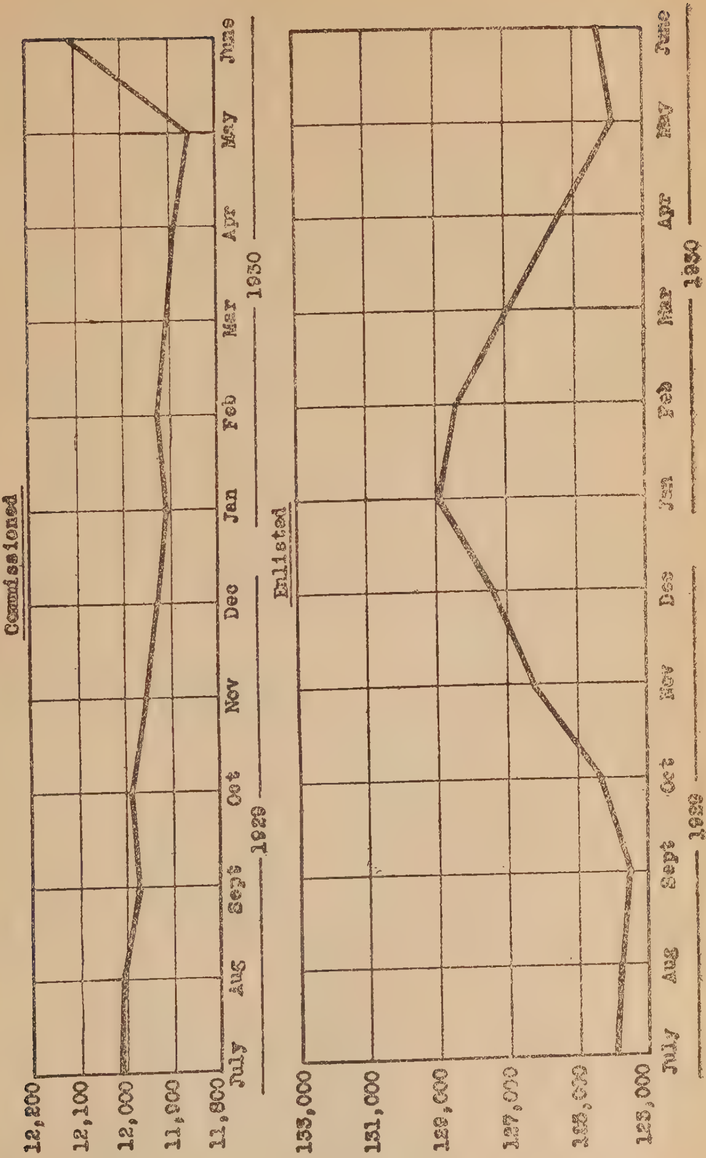
[3] Includes Panama civil government.

[4] Includes American Graves Registration Service and, commencing April, 1930, escorts gold-star mothers and widows visiting American cemeteries in Europe.

[5] Includes military attaché, officers of the Philippine Scouts attending general and special service schools in continental United States, personnel on leave and en route to and from oversea garrisons.

[6] Includes personnel of the retired list on active duty.

FLUCTUATIONS IN ARMY PERSONNEL
(fiscal year 1930)



B.—TABLE SHOWING THE STRENGTH OF THE REGULAR ARMY OF THE UNITED STATES, JUNE 30, 1929, AND JUNE 30, 1930, AND LOSSES DURING THE FISCAL YEAR INTERVENING

Arm or Service	Strength June 30, 1929		Strength, June 30, 1930		Losses													
					Enlisted men													Enlisted men returned from desertion
							Discharged				Died							
	Officers	Enlisted men	Officers	Enlisted men	Retired	Relieved from active duty	Expiration of service	Disability	By sentence of general court-martial	Other causes	Of disease	Of accident	Drowned	Suicide	Homicide	Deserted	Dropped	Total	
General officers of the line	67	....	67	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
General Staff Corps	220	....	213	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Adjutant General's Department	95	....	91	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Inspector General's Department	40	....	41	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Judge Advocate General's Department	90	....	95	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Quartermaster Corps	705	7,543	706	7,536	70	...	2,273	82	100	862	12	10	1	3	..	333	50	3,796	198
Medical Department	1,187	6,715	1,202	6,417	31	...	2,017	129	110	963	13	6	1	5	2	528	96	3,901	309
Finance Department	119	401	120	400	3	...	125	4	1	44	1	1	1	..	..	2	.....	182	1
Corps of Engineers	395	4,579	401	4,465	22	...	1,159	121	69	540	5	2	4	2	1	319	46	2,290	142
Ordnance Department	278	2,349	277	2,250	35	...	626	21	30	266	5	3	..	2	2	110	4	1,104	52
Signal Corps	215	2,430	208	2,625	7	...	601	25	32	377	11	2	..	..	1	140	22	1,218	68
Chemical Warfare Service	76	425	78	413	1	...	100	5	8	68	3	...	..	..	..	28	1	214	18
Bureau of Insular Affairs	3	....	3	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Chaplains	123	....	120	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Professors, U. S. Military Academy	8	....	8	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Cavalry	613	8,348	609	7,794	46	...	2,292	142	203	1,279	27	7	..	3	3	1,089	193	5,284	636
Field Artillery	919	14,971	903	14,633	27	...	3,570	188	335	2,183	24	22	1	5	4	1,561	316	8,236	917
Coast Artilery Corps	697	12,168	655	12,324	81	...	2,627	258	171	1,537	19	9	7	3	..	678	73	5,463	310
Infantry	2,355	41,368	2,303	41,259	167	...	11,533	648	622	5,486	93	32	6	10	7	3,244	780	22,628	1,805
Air Corps	1,192	10,890	1,271	12,034	36	...	2,703	128	74	2,470	14	33	4	2	..	433	87	5,984	212
Detached list	2,546	5,514	2,653	5,647	95	...	1,688	24	33	368	15	4	..	3	..	167	13	2,410	81
Total, less Philippine Scouts	11,943	117,701	12,024	117,797	621	...	31,314	1,775	1,788	16,443	242	131	25	38	20	8,632	1,681	62,710	4,749

Philippine Scouts:																			
Judge Advocate General's Department	1	......	1	......	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Quartermaster Corps	10	432	10	422	...	...	67	5	1	6	2	...	..	..	..	.....	.....	81	.....
Medical Department	......	327	......	314	...	...	43	2	.....	1	1	...	..	..	..	.....	.....	47	.....
Finance Department	......	7	......	6	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Corps of Engineers	4	320	5	323	...	...	32	3	.....	3	...	1	..	..	..	.....	.....	39	.....
Ordnance Department	......	49	......	49	...	...	7	.....	.....	......	...	...	..	..	..	.....	.....	7	.....
Signal Corps	2	125	2	127	...	...	16	1	.....	1	...	...	..	..	..	.....	.....	18	.....
Cavalry	4	591	4	591	...	...	82	8	2	9	1	...	..	..	..	1	.....	103	1
Field Artillery	8	990	7	989	...	...	221	11	.....	3	2	...	..	..	..	.....	.....	237	.....
Coast Artillery Corps	9	1,295	9	1,300	...	...	77	8	.....	7	5	...	1	..	..	1	.....	99	1
Infantry	46	2,355	42	2,359	...	...	209	22	2	19	8	...	..	..	1	.....	.....	261	.....
Air Corps	1	....	1	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Detached list	2	....	1	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Total	87	6,491	82	6,480	...	...	754	60	5	49	19	1	1	..	1	2	.....	892	2
Grand total	12,030	124,192	12,106	124,277	621	...	32,068	1,835	1,793	16,492	261	132	26	38	21	8,634	1,681	63,602	4,751
Warrant officers:																			
Army Mine Planter Service	37	....	40	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Band leaders	93	....	93	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Others	1,008	....	956	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Total	1,138	....	1,089	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Retired, on active duty:																			
Regular Army	131	24	136	24	...	4	......	.....	.....	......	...	...	..	..	..	.....	.....	4	.....
Philippine Scouts	14	....	13	....	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Total	145	24	149	24	...	...	......	.....	.....	......	...	...	..	..	..	.....	.....	......	.....
Aggregate	13,313	124,216	13,344	124,301	621	4	32,068	1,835	1,793	16,492	261	132	26	38	21	8,634	1,681	63,606	4,754

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[1] Honorably: Regular Army, 5; Philippine Scouts. 1.

IX. DEFENSE AND ARMAMENTS

ACCOMPLISHMENTS OF ARMY PERSONNEL

By Robert S. Thomas

Chief Clerk, Historical Section, Army War College

INFANTRY

Organization.—During the year, a project involving the reorganization of the Infantry war-strength regiment has been tentatively completed. The object of the reorganization was to obtain maximum fire power with the present standardized weapons without unduly increasing the personnel and without sacrifice of flexibility. The proposed organization differs in the main from the present in the following respects: caliber .30 automatic rifles in the squad increased from 1 to 2; caliber, .30 machine guns in the battalion increased from 12 to 16; the addition of a regimental machine gun company of 16 guns; 37-mm. guns and 75-mm. mortars increased from 3 to 8 and incorporated in a new company called the Cannon Company; and the motorization of the field train. The total personnel of our present regimental organization numbers 3,008, while the tentative reorganization calls for 3,577. The 29th Infantry Regiment was used as the testing medium for this project.

Weapons.—The utility of an air-cooled caliber .50 machine gun in the dual capacity of an anti-tank and anti-aircraft weapon has been carefully investigated and will be subjected to further research. The Infantry has coöperated with the Ordnance Department in experiments to produce a new .30 caliber semi-automatic rifle and also to modify the 37-mm. gun mount to fit it for action against fast-moving tanks. Limited experiments with an improved 75-mm. smooth bore mortar were conducted with a view to substituting this weapon for the present Stokes type 3-inch mortar and 75-mm. rifled mortar.

Motorization.—The 34th Infantry Regiment has been completely motorized with modern vehicles and is now carrying on exhaustive experiments in the Third Corps Area. It is believed that the results of these tests will determine conclusively the most desirable types of commercially manufactured motor vehicles suitable for Infantry.

Anti-aircraft Defense.—The employment of Infantry weapons against low-flying aircraft is a subject of continuing development and testing. Satisfactory results with the rifle and automatic rifle have attended the first year's test of the provisional methods of training in anti-aircraft firing. For the caliber .30 machine gun, a special anti-aircraft sight has been devised and issued for service tests; the results of these tests will determine the adoption of standard methods of machine gun anti-aircraft training.

CAVALRY

Motorized Units.—Extensive maneuvers were carired out during the year at Fort Bliss and at Fullerton, Tex., from which much valuable experience was gained, particularly in connection with the use and value of motorized units. Jan. 27, 1930, the Secretary of War authorized the expenditure of $20,000 to carry on experimentation, with the advice of the Chief of Cavalry, for the purpose of developing a satisfactory type of armored car. With this money, Provisional Platoon, Troop A, 2d Armored Car Squadron, was equipped with eleven armored cars and two trucks. To secure the best results experimentally six cars of this platoon have been equipped in pairs with diversified armament—one pair carries the .50 caliber water-cooled gun as its main armament; one pair, a Lewis gun; and the remaining pair, a Browning machine rifle.

Operations.—From March, 1929, to June 30, 1930, six regiments of cavalry covered a total of 3,300 miles in long marches on the Mexican border and in maneuvers. The beneficial results accruing from improved instruction in riding and in the care of animals were very evident during these marches, both in the rapid rate of march maintained and in the splendid condition of the horses. In addition to their own maneuvers, cavalry units of the Third and Fourth Corps Areas had the advantage of combined training with other arms of the service.

FIELD ARTILLERY

Equipment.—With the knowledge that little, if any, equipment developed during a war is produced in any quantity during that war, the Field Artillery has considered as one of its paramount peace-time missions the coöperation with the supply departments in the development of the best equipment possible for standardization and quantity production at the outbreak of war. Commercial motor vehicles are being continuously tested to determine the suitability of improved types for military use.

Horsemanship. — The great resources of our country in animals, pointing to the continued use of horse traction for the lighter calibers until motorization shall have progressed to standardization, has made necessary that training in animal draft and in horsemanship be maintained at a high standard in the Field Artillery School and throughout the service. The high type of instruction maintained is reflected in the creditable participation of Field Artillery officers in the great international horseshows both at home and abroad.

COAST ARTILLERY CORPS

The Corps within the continental limits of the United States has been completely reorganized during the past year. Development of anti-aircraft artillery has been steadily advanced with the objective of taking over in time of war the major part of the defense against air attacks, leaving the Air Corps free to act on the offensive. Successful firings were conducted with seacoast artillery against moving targets at ranges in excess of 40,000 yards in which all locations of the target and the fall of the shots were furnished by airplane observation. (For Air Corps see "Military Problems of The United States" and "Army Aeronautics.")

ENGINEER CORPS

The strength of the Corps at the end of the fiscal year was 564 officers and 4,674 enlisted men. Engineer Corps troops completed about 1,200 square miles of general topographic mapping. These data are published in quadrangle sheets at Army reproduction plants and are available for public use at a nominal cost. The personnel of the Corps performs diversified services directly beneficial to the public. Four of its officers serve with the civil government of the District of Columbia; two officers are assigned to the Federal Power Commission; three, with the American Battle Monuments Commission; and one is the engineer officer on duty with the Arlington Memorial Bridge Commission. Three engineer officers are assigned to the Panama Canal Zone civil government, one of them serving as Governor of the Zone. Six officers are on duty with the Alaska Road Commission and on river and harbor duty in Alaska. Since last October a battalion of engineer troops consisting of 21 officers and 213 enlisted men have been on duty in the Republic of Nicaragua, making a survey to establish the most practicable route for the construction of a canal across that Republic.

SIGNAL CORPS

Radio Service.—A new high frequency 10 kilowatt transmitter was installed at Fort Myer, Va., and a similar unit at San Francisco. Through these, reliable and direct contact between Washington and San Francisco is provided. Similar units are being located at Honolulu and Manila. On army transports, modern, intermediate frequency equipment has replaced 50 per cent of obsolete types and plans are in motion for 100 per cent replacement by the end of the current fiscal year. An improved headset, a cavalry pack radio set, a spotting set for locating anti-aircraft gun fire by photographic means, and a new field wavemeter were developed to standardization during the year. A tank radio set was completed and offered to the Tank Corps for testing. Two mobile power units and one mobile battery charging set using gas-electric drive truck chassis were also brought to the point of official testing.

Army Amateur Radio System.—This system led all amateur stations in the number of favorable reports for successful two-way communication. In time of disaster, this system stands ready to serve the American Red Cross with which it is affiliated. Recently, when Santo Domingo was struck by a hurricane, and it appeared likely that the storm would sweep the Gulf states and the Atlantic seaboard, certain Fourth Corps Area stations stood by for emergency operation and obtained and relayed much valuable information regarding the progress of the storm.

Telephone and Telegraph Service.—At the end of the year, the Signal Corps operated 138 telephone switchboards and 25,268 sub-stations. In addition, two telephone systems are jointly owned by the Government and telephone companies.

Photographic Service.—The Army Pictorial Service proivdes general photographic service for the Army, excepting specialized photography employed by certain branches, notably the Engineer and the Air Corps. The custody of the War Department pictorial historical files, both still and motion pictures, is the responsibility of the Signal Corps, and these are properly housed, indexed, and catalogued. There has been a marked increase in the requests for loans of Signal Corps historical and military topical films. Such films are loaned chiefly to veteran and patriotic societies, Reserve, and National Guard organizations, and schools, by which they are used as a most desirable method of graphically presenting the varied activities of the Army.

Meteorological Service.—The Signal Corps operates thirty-five meteorological stations within the borders of the United States, and, in addition, one in the Hawaiian Islands, one in the Philippines, and one in the Canal Zone. The Ordnance Department, the Field Artillery, the Chemical Warfare Service, and the Air Corps use the meteorological data thus obtained since they are readily available hourly during the twenty-four hours of the day. Effective co-operation was maintained during the year between the meteorological services of the U. S. Weather Bureau, the Army, and the Navy. This co-operation eliminated duplication of effort and made available to each of these three services the results of observations made by all.

Statistics.—The total amount of Government traffic handled by the Signal Corps communication facilities during the fiscal year 1930 was 61,335,371 words, representing a value of $551,589.27 if commercially despatched at Government rates. The total number of original sent messages was 463,084 containing 21,348,462 words. The increase in radio traffic over the preceding year was approximately 50 per cent. Despite the unusual business depression which prevailed during the year, the Washington-Alaska Military Cable and Telegraph System handled a net increase of $85,722.45 worth of business. This increase was principally Government traffic for the dissemination of meterological data within and from Alaska in order that air service in Alaska may be provided with reliable information in the conduct of airways, already established or contemplated. The increase of valuation of radio traffic over 1929 amounted to $185,095.40. At the close of the fiscal year there were 82 land radio stations operating in the War Department and Corps Area radio nets, and 68 ship stations. At the beginning of the year, 47 branches, bureaus, and departments of the Government used the War Department radio facilities. This number has been increased to 50 and a considerable portion of the traffic thus gained was handled for the Bureau of the Census and the Federal Farm Loan Board.

THE MILITIA BUREAU

Organization.—The reciprocal military relationship existing between the state and the Federal Governments is administered through a bureau of the War Department called the Militia Bureau, whose chief is a National Guard officer holding a commission in the Officers' Reserve Corps of the Army of the United States. For 1930, the authorized strength of the National Guard was fixed at 190,211. Actual strength on June 30, 1930, was 182,715 divided among 829 headquarters and 3,187 units which were scattered throughout continental United States, Porto Rico, and Hawaii. On June 30, 1930, there were 18 Infantry Divisions and 4 Cavalry Divisions which had received Federal recognition.

Air Units.—There are 19 airplane observation squadrons in the National Guard; these accumulated a total of 51,586 flight hours during the year. Arrangements were completed for the substitution of Browning machine guns on flexible mounts for Lewis guns, all of the latter type having been ordered turned into Ordnance depots. Arrangements were also made to secure two gun cameras for each of the 19 squadrons, these to be adaptable to either fixed or flexible guns.

Training.—The training of these states forces is supervised by officers of the Regular Army and consists of a minimum legal drill requirement of 48 drill periods yearly, each of not less than one and one-half hours' duration, in addition to fifteen days of field training in encampments or maneuvers. For these drill periods, compensation is provided from the Federal appropriations for each drill attended by officers and men at approximately one-thirtieth of the monthly pay for like grades in the Regular Army, while compensation for the fifteen days of field training is the same as for the Regular Army. Authority also exists for the attendance of officers and enlisted men at various Regular Army service schools and, since 1920, 2,587 officers have received instruction at these schools. National Guard officers may also be detailed for duty in the Militia Bureau and on the War Department General Staff, both for the purpose of giving instruction to National Guard officers and to bring to the consideration of important policies, the viewpoint of the citizen-military forces.

Service in Emergencies.—In the First Corps Area, detachments of the National Guard were called out to fight forest fires; in the Second Corps Area, New York units were called to active duty twice in connection with riots at Auburn State Prison; in the Fifth Corps Area, various detachments of Ohio troops were called to duty in connection with an emergency arising from fire at the Columbus State Penitentiary; in the Sixth Corps Area, small detachments were ordered out on several occasions in connection with minor labor disturbances; in the Seventh Corps Area, small detachments assisted in flood and storm relief work, in adition to a call for riot duty in Jefferson City, Missouri; in the Eighth Corps Area, a detachment of the Texas National Guard was ordered to Sherman to enforce martial law following an outbreak of mob violence and another detachment was sent to the oil fields about Borger to enforce martial law; Colorado National Guard units were called to active duty in connection with fire and mutiny at the Carson City Penitentiary; New Mexico units performed flood relief work at San Marcial and later maintained order at an election in Las Vegas; and Oklahoma units were ordered to Chickasha for duty in connection with race riots.

THE ORDNANCE DEPARTMENT

Weapons and Munitions. — The 37-mm. infantry mortar, 37-mm. gun, and 75-mm. howitzer have been produced during the year by the centrifugal casting manufacturing process and have met all tests satisfactorily. Various semi-automatic shoulder rifles were tested and, as a result, the Ordnance Department has recommended the manufacture of a new type of .30 caliber weapon which it is believed will come within existing weight specifications and develop maximum firing efficiency. A 3-pounder gun, semi-automatic in action, was developed as a tank weapon and is proving satisfactory. A new smooth-bore 75-mm. infantry mortar has also been evolved to replace the former rifled type. Studies made of the generation of charges of static electricity in the blending of smokeless powder show that, when the relative humidity of the atmosphere is 60 per cent or more, the static charge accumulated by the powder is negligible. Observations are being made of the effects of lower degrees of humidity in order to determine the practicability of reducing the dangers of the blending operation by conducting this operation onlv when atmospheric conditions are within prescribed limits.

Ordnance Districts.—The policy of the War Department for industrial mobilization in time of an emergency is still actively continued to assure the availability of adequate facilities for such items as may be required. In order to attain this result, the country is divided into fourteen Ordnance Districts, in each of which is an organization of eminent civilian business and technical men as reserve officers who are doing in peace time the maximum of practical planning for war time production. Various plants and factories are included in the operation of this plan because they have signified their willingness to take over a certain percentage of the production burden and make those studies necessary to the proper adaptation of their facilities in oder that needed articles may be produced without disturbing peace time operations of the factories in question.

Anti-aircraft Weapons.—A new 37-mm. anti-aircraft mount has been designed, principally of welded construction; two anti-aircraft multiple machine gun truck mounts, designed to protect marching troops, have been constructed and are ready for testing; interchangeable liners for 3-inch fixed anti-aircraft guns have been perfected; an anti-aircraft multiple machine gun truck was developed and delivered to the proving ground for testing; and tests have been conducted to determine the suitability of several types and makes of tracks for use as prime movers for anti-aircraft guns.

THE MEDICAL DEPARTMENT

During the year the Medical Department of the Army was responsible for the professional care and treatment of approximately 286,106 individuals. The average number of patients in military hospitals each day was 6613, of which 4260, or 64.42 per cent, were in General Hospitals. The Army Research Board, maintained in Manila, has contributed much in the field of preventive medicine during the past few years. Conspicuous among the studies of this board are those on the etiology of dengue and its transmission by mosquitoes, and the preparation of a highly potent rinderpest vaccine. Intensive campaigns waged against communicable diseases during the past year have produced gratifying results. There was a decline in the general admission rate for diseases from 586.53, for the previous year, to 526.43 for this year. With the exception of the rates for only two other years,—1922 and 1925—the rate for this year was the lowest ever recorded in the Army.

THE CHEMICAL WARFARE SERVICE

Pioneer work of past years is bearing fruit in the approaching completion of many items which have been in course of development. Special effort has been made to systematize procedure in development, test, and adoption of Chemical Warfare material. During the year, the following items of equipment have been developed: an improved diaphragm gas mask embodying the universal face piece which is designed to fit any face, with screw type eyepiece assembly, sun-proof hose tube without stockinet, and a lighter diaphragm with improved sound transmitting properties; a gas mask repair kit; a first aid kit for the treatment of gas casualties; and a field laboratory. Development of gas masks suitable for voice transmission for use with optical instruments such as range finders, field glasses, and periscopes is now nearing completion. In addition to the possible utilization of chemicals for military purposes, smoke has assumed an exceedingly important tactical place. Work on smoke screens, therefore, for protecting large areas has continued and the definite application of such screens to certain areas is now ready for testing. During the fiscal year, the production of 21,000 gas masks for the Army and 27,000 complete masks and 12,000 face-pieces for the Navy was undertaken. Other gas masks were completed for various governmental agencies for the purpose of furnishing protection in refrigerating plants, fire departments, and fumigation work.

THE FINANCE DEPARTMENT

Functions.—This is the agency through which the War Department pays its personnel and bills, makes collections due, and audits property accounts in the hands of accountable officers. The Chief of Finance, as War Department Budget officer, is charged with compiling and submitting, through the Bureau of the Budget, all estimates of funds for the several branches and services required for inclusion in the annual War Department appropriations made by Congress.

Commercial Invoices.—During the past fiscal year, the Finance Department handled 558,612 commercial invoices. These showed a maturity date when due for the full amount and also indicated a discount date. Every bill incurred by the War Department is met promptly on a cash basis thus effecting considerable savings. Vouchers numbering 893,056 were paid this year, either in cash or by check, and discounts earned on these payments amounting to $374,268.43. Since 1920, the Finance Department has saved the Government $3,111,203.93 by taking advantage of discounts offered. In the past year 1,833,186 checks totaling $334,232,241.90 were drawn by Finance Department disbursing officers.

Property Accounting.—All items of property purchased for the military establishment from moneys appropriated by Congress for the support of the Army as an agency of the national defense are audited by the Finance Department. This includes real estate, buildings, docks, piers, army transports, and machinery, as well as supplies purchased and issued to clothe, feed, and equip troops for field and garrison service. Property accounting records of the nonmilitary or civil activities of the War Department are not audited by the Finance Department. In the hands of Army agencies today, excluding value of grounds and buildings, there is well over two billions of dollars worth of property, the accounts of which are audited at least once annually.

Savings Accounts.—During the past fifty-seven years, the Army has maintained a savings bank feature wherein soldiers' savings may be deposited in sums not less than $5.00 to draw interest at 4 per cent per annum. Such deposits are returned to the soldier, with accumulated interest, upon separation from the service. This provision was initiated to care for soldiers' savings when most of the Regular Army was on frontier duty where banking facilities were unavailable. Cases of enlisted men retiring with sums above $5,000 to their credit are not rare. Present records show the largest single depositor to be credited with $20,000. The names of 7,402 soldiers with deposits totaling $1,635,967.12 were recorded in the past fiscal year. The Government paid $32,822.88 interest on these deposits. From June 30, 1873, to June 30, 1930, there was deposited $69,449,001.19, earning in interest $3,677,470.47.

THE BUREAU OF INSULAR AFFAIRS

This bureau constitutes the normal channel of communication in both directions between, on the one hand, the War Department and other agencies of the United States, and, on the other hand, the insular governments subject to the War Department jurisdiction. The Bureau's functions are, as regards the insular possessions in question, in many respects analogous to those of a Colonial Office for Civil Affairs. It acts in all matters pertaining to civil government in the island possessions of the United States subject to the jurisdiction of the War Department. Its detailed activities are not prescribed by Congress, but are subject to the control of the Secretary of War to whom its services are available. Supervision, under the War Department, to Philippine affairs has now been continuously exercised for over thirty years and over Porto Rican matters for about twenty years. During that time, and up to November 11, 1930, the Bureau of Insular Affairs has handled bond issues amounting, for the Philippine Islands, to over $140,000,000, and for Porto Rico, to over $37,000,000. It has purchased of the same bonds, for Philippine Islands sinking fund accounts, more than $30,000,000. It has handled deposits, in the United States, of Philippine public funds averaging, for the last day of the calendar years 1921-1929, over $49,000,000, and has secured for those deposits a high rate of interest. It has supervised in the United States purchases of supplies for the Philippine and Porto Rican governments averaging annually over $2,275,000 for the past five years. In addition, the Bureau has supervision of the Receivership of Dominican Customs, which is charged with the collection of customs of Santo Domingo and the rendition of appropriate accounts and reports incidental to those duties.

THE ADJUTANT GENERAL'S DEPARTMENT

The Adjutant General, as the administrative officer of the War Department, handles, through his office, a voluminous correspondence of all kinds. During the fiscal year, 3,091,852 separate pieces of mail matter were received, distributed to proper divisions and disposed of either by recording and filing or by having apropriate answers despatched. In July, 1929, a total of 294,796 communications were received, the largest amount entering the office during a single month, while the high mark for a single day was 29,087 pieces on Jan. 6, 1930. The fingerprints of 43,630 applicants for adjusted compensation were verified as were those of 3,128 persons who applied for certificates in lieu of lost or destroyed discharge certificates. Through this means of identifications, 2,189 persons were also identified as deserters, dishonorably discharged men, or financial delinquents.

THE QUARTERMASTER CORPS

Subsistence.—The continued effort to provide troops with good quality food in sufficient quantity and variety has resulted in contentment and improved welfare of the enlisted personnel. All purchases of subsistence supplies are now made through quartermasters with great practical advantages to all Army messes.

Horse Breeding.—During the 1930 breeding season, 620 stallions were at stud in 42 states, Hawaii, and Porto Rico, and were bred to approximately 18,600 mares. On the basis of past standards, the result would be a foal crop of at least 13,000 in the foaling season of 1931.

Cemeterial.—During the year, there were 3,586 interments in national cemeteries located in the United States, bringing the total figure up to 416,523, while in Europe in the eight permanent cemeteries there were on June 30, 1930, a total of 30,811 interments. There are 93 national cemeteries of the United States within its limits; one in Mexico, one in Alaska, and eight in Europe. An expedition to North Russia recovered and returned to the United States the bodies of 86 soldiers buried there. All of these were disposed of as directed by the nearest relative in each case and all bodies were identified. A second expedition, even though fraught with great difficulty, is considered so that the 38 bodies yet remaining in Russia may be recovered and returned. The remains of deceased soldiers buried in Alaskan abandoned military posts were removed to the Sitka National Cemetery. At Arlington National Cemetery, repairing of the Lee Mansion was completed, and restoration of the furnishings of the building to its condition prior to the Civil War was partially effected.

Pilgrimages of Mothers and Widows.—The first series of the annual pilgrimages to cemeteries in

Europe by mothers and widows of members of the military and naval forces of the United States who died in such services between April 5, 1917, and July 1, 1921, and whose remains are now interred in European cemeteries, occurred in the fiscal year 1930. A total of 14,134 mothers and widows were listed as eligible to make a pilgrimage and 3,634 of these went during the calendar year 1930. Others of the eligibles plan to go in 1931 or later. The letter and spirit of the Act of Congress, authorizing the Secretary of War to arrange for these pilgrimages, were carried by the Quartermaster General to whom was delegated the responsibility for preparing plans and managing the conduct of these trips.

Salvage and Land Sales.—Receipts from sales of waste material amounted to $684,349.88, of which $577,613.38 represented receipts from sale of waste material, while $106,736.50 was realized upon sales of garbage, manure, and dead animals. In addition to sales, considerable condemned property and waste material was applied to other uses than those for which originally intended, thus often securing better advantage to the Government than would have resulted from a sale. Six hundred and seventy-nine buildings were salvaged and the material used in repair work on other structures. Twenty-nine parcels of real estate, aggregating 1,250 acres, were purchased for $246,236.

Housing Program.—Steady progress has been made in effecting the housing program for which Congress has appropriated $40,000,000. Work on the 1927 program has been completed and has provided 660 hospital beds and housing accommodations for 7,983 enlisted men, 92 noncommissioned officers' families, and 18 officers' families; one item of the 1928 program remains incomplete. When this shall have been finished, there will have been provided under the 1928 schedule accommodations for 3,975 enlisted men, 196 hospital beds, and accommodations for 14 noncommissioned and 114 commissioned officers' families; at the close of 1930, nine projects in the 1929 program were unfinished—when complete they will provide 341 hospital beds and accommodations for 7,279 enlisted men and for 196 noncommissioned and 247 commissioned officers' families; when the 1930 program is completed, there will have been added to the housing facilities of the Army, accommodations for 4,801 enlisted men, 457 noncommissioned, and 373 commissioned officers' families, 51 hospital beds, and 29 nurses. There will still remain to be provided for, under the entire housing program, permanent accommodations for 14,000 enlisted men, 3,286 officers, and 2,463 warrant and noncommissioned officers, all of whom are now housed in temporary buildings or under canvas. Considerable other construction work was done during the year and much of the work of the Corps in this field was accomplished at a period when the Government was endeavoring to relieve the depressed economic conditions existing in the country. The Quartermaster Corps concentrated on the preparation of plans and the execution of work with the result that $19,677,000 was expended in the last seven months of the year for material and labor, an amount which under normal conditions would have been distributed over a much greater period of time.

Relief Work.—During 1930, the Quartermaster Corps rendered assistance to other than military activities in a number of instances where relief to civil life was imperative. Among these were: flood at Vincennes, Ind.; flood in Missouri and Arkansas; fire in Manila, P. I.; explosion at Devon, Penn.; fire at Altus, Okla.; fire at Nassau, N. H.; storm at Duncan, Okla.; tornado at Leavenworth, Kan.; flood at Shreveport, La.; and hurricane in Santo Domingo.

THE INSPECTOR GENERAL'S DEPARTMENT

During the fiscal year, while the economic side of annual inspections continued to be emphasized, the Inspector General's Department gradually resumed most of the duties of general inspection assigned to it by Army Regulations. There were received 747 reports of inspection and survey of Army activities, exclusive of National Guard activities; of these reports, 147 pertained to inspections of Army transports and 165 to C. M. T. C., R. O. T. C., and Organized Reserves affairs. Reports concerning National Guard units were transmitted by the inspectors directly to the Chief of the Militia Bureau. A critical review of the general and specific results of the years' work indicates that very definite progress has been made by the Army in conducting its administrative and supply operations in accord with modern business principles and methods.

THE JUDGE ADVOCATE GENERAL'S DEPARTMENT

Courts-martial.—There were examined during the year 4,701 records of trial by general courts-martial. In 15 cases the record of trial was found legally insufficient to sustain the conviction and sentence; in 51 other cases errors affecting the substantial rights of an accused were discovered requiring a partial reversal of judgment. A majority of all offenses charged in general court-martial cases came under the headings of desertion or absence without leave.

Contracts, Claims, and Property.—Approximately 2,000 formal written opinions were rendered on questions arising in connection with contracts made under the jurisdiction of the Secretary of War, real and personal property under his control, and claims in favor of or against the government.

Litigation and War Claims.—Nearly 400 cases including more than 300 claims filed under the War Claims Act of 1928, were disposed of. In suits brought by the United States against contractors and others, compromise settlements in favor of the United States amounting to about $160,000 were negotiated through the Department of Justice.

Miscellaneous.—During the fiscal year, there were prepared approximately 700 formal written opinions on a wide range of legal questions. The Judge Advocate General cooperated with the Bureau of Insular Affairs in Porto Rican and Philippine questions arising from their respective bond issues and represented these island groups in cases heard before the U. S. Supreme Court and the Court of Appeals. During the year, a revision of the military laws of the United States was completed and distributed to the service. The Law Office in the office of the Judge Advocate General received accessions of 479 books.

CORPS OF CHAPLAINS

The fiscal year just closed has marked a distinct advance in chaplains' activities of the Army. New fields of service have been entered and the work carried forward with gratifying results. While the number of services held by chaplains did not show an increase, auditors have been mutliplied by the use of the radio, thus extending the influence of the Corps to thousands not residing on Army Posts. Similar microphone facilities have been made available on Army transports. A new Memorial Chapel at Walter Reed General Hospital, Washington, D. C., is under process of construction, while several other chapels at various Posts have undergone alterations and improvements. Approximately 1,774,180 persons attended 18,791 religious services conducted by the Corps of Chaplains during the year.

CIVILIAN PERSONNEL DIVISION

Under the direction of Assistant and Chief Clerk, John C. Scofield, this office exercises administrative control in matters pertaining to civilian employees in the War Department and with the Army. This task involved during the past year decisions of all matters of Civil Service law and rules, reclassification allocations and schedules, retirement determinations, and compensation changes for a clerical force, departmental and field, numbering 53,169.

PANAMA CANAL

The Panama Canal, while not a part of the War Department, is under the personal supervision of the Secretary of War, and its present Governor, Col. Harry Burgess, is an officer of the Engineer Corps. The total number of transits through the canal during the fiscal year was 6,185, representing a carrying of 30,030,232 tons, for which tolls were collected amounting to $27,076,890.

ARMY AERONAUTICS

By Robert S. Thomas

Chief Clerk, Historical Section, Army War College

AIR CORPS PROGRAM

Personnel.—The Five-Year Program is divisible into two logical sections, personnel and material. With the first of these has arisen the most pressing question affecting the Air Corps, the promotion problem. Owing to sluggish promotion schedules within the Army, many Air Corps officers are still performing duties out of all proportion to their rank. During the year, twenty-seven Air Corps officers resigned, a new high record for separations. In 1921, there were but nine such resignations, but the figure has risen steadily in the succeeding years. However, many officers who have received tempting offers from commercial air firms are remaining in the military service in the hope that Congress will eventually enact remedial legislation. Conditions in this respect among the enlisted personnel have somewhat improved. In some instances it has been possible to secure better pay for skilled mechanics in the lower grades and better promotion for men in the higher grades. This has operated to increase the number of reënlistments and has reduced the number of separations from the service.

Material.—On June 30, 1930, there were on hand 1,319 airplanes and 211 on order. The greatest present need is for additional bombardment planes. During the past year, material improvement was attained in both air and liquid-cooled engines through the use of higher compression ratios and supercharging. Particularly excellent results were obtained from the air-cooled engine of the radial type. Because of extensive research in the recording of the cycle of operation within the engine cylinder, it is anticipated that, in the near future, it will be possible to show by means of standardized record cards the actual operating conditions of an engine throughout its entire flight. Another equally important investigation under way has for its object the development of a suitable torsionmeter for recording torsional vibration of engine crankshafts.

MANEUVERS AND FLIGHTS

The annual Air Corps Field Exercises were held at Mather Field, Calif., in April, 1930, and resulted in several notable achievements. One squadron employed radio telegraphy so successfully as to forecast the development of new methods of control and coördination between air and ground units in tactical work. Geographical features of terrain 270 miles distant were recorded by long-distance aerial photography and a new speed record was made when the city of Sacramento was photographed from the air, the negative developed in the airplane, and then dropped within twelve minutes to a waiting newspaper representative on the ground. To determine the feasibility of moving pursuit units long distances by air during winter weather conditions and to test existing equipment under such stress, the First Pursuit Group flew from Selfridge Field, Michigan, to Spokane, Washington, and return, Jan. 10 to 29. For mapping purposes, approximately 14,000 square miles of terrain in scattered parts of the United States were photographed during the year. Throughout all flights made, there has been noted a marked decrease in the number of men lost through accidents.

METEOROLOGICAL INFORMATION

The use of teletype circuits for transmission of weather information was further extended during the year. Bolling Field, Phillips Field, and Mitchell Field were included in the teletype circuit installed by the Aeronautics Branch of the Department of Commerce between Atlanta and Boston. Similarly, Wright Field was provided with teletype service on the line from Cleveland to St. Louis. It is now possible to obtain weather reports on this line from every reporting station every thirty minutes of the twenty-four hours of the day. It is also possible to obtain weather reports through junction points between these lines and the lines from New York to Chicago and any points on many of the Department of Commerce teletype circuits east of the Mississippi River.

AIR CORPS STATISTICS

On June 30, 1930, the commissioned strength of the Air Corps was 1,266; the enlisted strength, 12,032, including 378 flying cadets. The buildin of barracks, officers' quarters, warehouses, and other construction to th value of $6,415,000 was accomplishe during the year, while technical construction valued at $1,000,000 wa completed, including the installatio of modern night flying lighting a flying fields. Fourteen Air Corps three Marine Corps, one foreign, an eleven officers from the several othe arms of our military service wer graduated from the Air Corps Tactical School. Facilities at the Ai Corps Engineering School were expanded during the year but work wa somewhat hampered by the scarcit of highly trained and specialized engineers available as instructors. Ther were 103 acceptances out of 108 appointments proffered in the Air Corp Reserve to R.O.T.C. graduates. I the Organized Reserves there are a present 3,675 rated air officers, divided into groups representative o actual flying experience obtained while in the National Guard ther are on the recognized list a total o nineteen Air Corps units which hav all reached a high state of proficienc in training.

MILITARY EDUCATION

By Robert S. Thomas

Chief Clerk, Historical Section, Army War College

INFANTRY SERVICE SCHOOLS

Functions.—The mission of the Infantry anl Tank Schools is to train officers and enlisted men of Infantry units of the Regular Army, National Guard, and Organized Reserves in the tactics and technique of Infantry and give them a working familiarity with the tactics and technique of associated arms.

The Infantry School is located at Ft. Benning, Ga. Of 3,644 officers of the Infantry, 2,376 are graduates of one of the courses at this school. The following courses were carried on in 1929-30: Refresher Course for senior Regular Army officers—15 graduates; Advanced Course for field officers an senior captains, Regular Army—8 graduates; including 3 Philippin Scouts, 2 Cavalary, 1 Air Corps, an 1 Field Artillery; Company Officers Course for Captains and Lieutenants Regular Army—82 graduates, including 2 Field Artillery, 1 Medical Administrative Corps, 1 Marine Corps and 1 Cuban Army; National Guar and Reserve Field Officers' Course—17 graduates (all National Guard) National Guard and Reserve Officers Rifle Course—79 graduates (53 National Guard, 26 Reserve); Nationa Guard and Reserve Officers' Machin Gun and Howitzer Course—56 gradu ates (32 National Guard, 24 Reserve); National Guard Enlisted Specialists' Course—45 graduates; Horseshoers' Course, Enlisted Men of Regular Army—13 graduates.

The Tank School is located at Fort George G. Meade, Md. In 1929-30, the following courses were taught: Officers' Course, Regular Army—50 graduates, including 1 Cavalary; Special Course of two weeks' duration in August, 1930—attendance, 15. The purpose of this course was to provide tank instruction for officers whose rank, age, or status rendered it difficult or impossible for them to attend a regular tank course; National Guard and Reserve Officers' Course—13 graduates, 3 National Guard, 10 Reserve; Enlisted Men's Courses divided into: Motor Mechanics—65 graduates; Communications—7 graduates, Stenography and Typist—15 graduates; Clerical and Typist—11 graduates; Battery Repair and Maintenance—14 graduates.

CAVALRY SCHOOL

The Cavalry Scohol, located at Fort Riley, Kansas, continued during the past year its mission of imparting instruction to selected officers and enlisted men in the technique of cavalry and in qualifying these individuals for instructional duties within the Army. During 1929-30, the following courses for commissioned officers were conducted at the Cavalry School: Troop Officers' Course; Advanced Course; Advanced Equitation Course; Refresher Course; National Guard and Reserve Troop Officers' Course; and National Guard and Reserve Field Officers' Course. There were in attendance during the year, 78 Regular Army officers, 17 National Guard, and 8 Reserve. Courses for enlisted men were: Noncommissioned Officers' Course, attended by 41 noncommissioned officers of the Regular Army and 13 of the National Guard; Horseshoers' Course and Saddlers' Course, attended by 63 enlisted men. During the school year, one officer attended the *École de Superieure de Guerre* in France and one attended the French Cavalry School at Samur; one attended the Italian Cavalry School, one the German, and one the Polish Cavalry School. Supplementing instruction at the Cavalry School, instruction has been given during the year to 2,135 individuals through the medium of correspondence courses.

ARTILLERY

The Field Artillery School at Fort Sill, Okla., serves as an agency of the Chief of Field Artillery in the development of Field Artillery technique and tactics and disseminates that knowledge to all components of the Army. During 1929-30, there were graduated from the various courses the following:

Regular Army Officers	
Advanced Course	27
Battery Officers' Course (including 1 USMC)	71
Advanced Course in Motors	5
Advanced Course in Horsemanship	6
Refresher Course for Field Officers	5
National Guard and Reserve Officers' Battery and Field Officers' Courses	75
Enlisted Men	
Horseshoers' Course	29
Motor Mechanics' Course	7
Saddlers' Course	16
Battery Mechanics' Course	11
Communications Course	47

The Coast Artillery School at Fort Monroe, Va., conducts courses for field officers, battery officers, and enlisted men of the Regular Army, National Guard, and Organized Reserves. The school keeps abreast with the latest developments in tactics and technique of all types of fixed, railway, tractor-drawn, and anti-aircraft artillery. A total of 120 officers and 78 enlisted men were graduates from the courses held during the school year ending in June, 1930.

ENGINEERING AND SIGNALING

The Engineer School, located at Fort Humphreys, Va., was established to develop and standardize the instruction and training of Engineer officers in the tactics and technique of the Engineer arm, and the civil duties of the Corps of Engineers. For the year 1930, there were conducted: a Company Officers' Course—19 graduates; a National Guard and Reserve Officers' Course—19 graduates; and an Enlisted Specialists' Course—28 graduates. Nine officers pursued engineering courses at Cornell University; two at Massachusetts Institute of Technology; three at the University of California, one at Rensselaer Polytechnic Institute; one at Oxford University, England, and one at the Swiss Federal Institute of Technology, Switzerland. In addition, the following were assigned as students: four to the Army War College; three to the Army Industrial College; sixteen to the Command and General Staff School; two to the Chemical Warfare School; one to the Coast Artillery School; one to Babson Institute; and one to the *École de Superieure de Guerre*, France. At the end of the school year, the total enrollment of Engineer units, Reserve Officers' Training Corps, amounted to 5,064, of whom 19.5 per cent were in the advanced course.

The Signal School at Fort Monmouth, N. J., conducted the following courses in the school year 1929-30: Communications Officers' Course—37 graduates divided as follows: 27 from the Infantry, 4 from the Cavalry, 2 from the Field Artillery, 1 from the Coast Artillery, and 1 from the Marine Corps, Company Officers' Course—13 graduates, all from the Signal Corps. From the three-months' National Guard and Reserve Officers' Course, there were graduated 11 National Guard and 5 Reserve officers. The Enlisted Specialists' School graduated 126, of whom 64 were from the Signal Corps and 62 from other arms of the service. Officers were taught the theory and operation of electrical communication equipment together with their coördination and application for military purposes. Enlisted men were taught to be expert telegraph, telephone, and radio operators and to be proficient in the management of signal communication stations.

FINANCE AND ACCOUNTING

The Finance School, located in Washington, D. C., is divided into two departments, (a) Department of Finance and Accounting and (b) Department of Property Accounts Auditing. The school is conducted with a personnel of one officer, two warrant officers, and nine enlisted men. There were graduated 54 students last year, making a total of 666 graduates since the establishment of the school ten years ago.

MEDICAL DEPARTMENT

The Army Medical School, located in Washington, D. C., conducts basic and advanced courses for officers and courses for enlisted specialists. The Medical Field Service School at Carlisle Barracks, Pa., serves as the tactical school for the Medical Department. The Army Dental School in Washington, D. C., trains officers in professional and technical subjects pertaining to the Dental Service of the Medical Department. The Army School of Nursing conducts a three-year course in nursing at Walter Reed General Hospital, Washington, D. C. The Army Veterinary School, located at Washington, D. C., trains officers for professional and technical duties incidental to veterinary work in the Medical Department. The School of Aviation Medicine, at Brooks Field, Tex., trains officers to qualify as flight surgeons. The following graduated from the schools of the Medical Department for the school year 1929-30: Army Medical School, Basic Course—39 officers; Advanced Course—5 officers; *x-ray* Technicians' Course—23 enlisted men; Army Dental School, Basic Course—8 officers; Advanced Course—1 officer; Dental Mechanics' Course—10 enlisted men; Army Veterinary School, Basic Course—7 officers; Veterinary Technicians' Course—8 enlisted men; Medical Field Service School, Basic Course—52 officers; Advanced Course—8 officers; Field Officers' Course for Organized Reserve and National Guard Officers—13; Noncommissioned Officers' Course for Regular Army and National Guard personnel—59 enlisted men; School of Aviation Medicine, three courses for Regular Army—4 officers; three courses for Organized Reserves—31 officers; National Guard—1 officer; The Army School of Nursing graduated 46 students.

ORDNANCE SCHOOLS

Watertown Arsenal.—Junior Ordnance officers are given a two-year course at the Ordnance School. Approximately ten officers enter each year. The first year's work is given at the Massachusetts Institute of Technology and is a course in advanced mechanical engineering with special reference to the design of Ordnance material. The second year's work, at Watertown Arsenal, covers such subjects as metallurgy, foundry and machine shop practice, and the duties of Ordnance officers with combat units.

Raritan Arsenal.—The Ordnance Specialists' School trains selected noncommissioned officers. Fifty-six attended this school in 1930. Courses in various trades pertaining to Ordnance supply and maintenance are given also to selected enlisted men, 94 being so instructed in 1930. Officers likewise are instructed in this school in the construction and operation of various classes of material issued to the Army by the Ordnance Department and in the general duties of Ordnance officers in the field. Eight officers received such instruction in 1930 and, in addition, thirty-four Petty Officers of the Navy were given special training of the same general nature.

Ordnance Officers in College.—Two Ordnance officers graduated from Harvard Graduate School of Business Administration in 1930.

CHEMICAL WARFARE INSTRUCTION

The Chemical Warfare School offers five courses annually to officers of the Army and of the Navy: Unit Gas Officers' Course—24 attended; Line and Staff Officers' Course—35 attended; Navy Line Officers' Course—24 graduated; Naval Constructors' Course—4 enrolled; Field Officers' Course—51 graduated. In addition, 49 officers attended a 4-day course at Fort George G. Meade, which was given to demonstrate the latest developments in Chemical Warfare weapons and material. The aim of all instruction is to impart such an understanding of chemical warfare as will enable officers to command their units with the maximum efficiency with respect to this phase of combat.

QUARTERMASTER SCHOOLS

During the year, about 10 per cent of the officers of the Quartermaster Corps were students at schools, including the Army War College, Command and General Staff School, Army Industrial College, the several Quartermaster Schools, Holabird Motor Transport School, the French *École de L'Intendance,* Harvard School of Business Administration, Babson Institute, University of Michigan, Philadelphia Textile School, and Massachusetts Institute of Technology.

The Quartermaster School at Philadelphia graduated 26 Regular Army officers in regular courses and 4 National Guard and 2 Reserve officers in special courses. One foreign officer also attended this school. From the Warrant and Noncommissioned Officers' Course, there were 36 graduated. The purpose of this school is instruction in administration, supply, transportation, construction, remount service, business management, mobilization plans, military organization, logistics, and field exercises.

The Subsistence School at Chicago gives special instruction relating to proper and economical feeding of the Army and conducts practical research along these lines. In 1930, graduates from this school included 7 Quartermaster officers, 4 officers from other arms, 3 Navy officers, 1 Marine Corps officer, and one Quartermaster enlisted man. Three Quartermaster Reserve officers were given a 14-day active duty tour at this school.

The Motor Transport School at Camp Holabird, Md., graduated 16 from the officers' course and 97 from the enlisted men's course. Twenty-one Reserve officers took a special two weeks' course.

Schools for Cooks and Bakers conduct special courses in mess management. From all arms of the service, these schools graduated approximately 700 officers and 1,700 enlisted men.

Troop Schools at Garrisons, scattered throughout the Army, conducted thirty-hour courses in mess management.

Instruction of Reserve Officers.—Approximately 500 Quartermaster Reserve officers of the Branch Assignment Group received active duty training during the year, while about 1,000 Reserve officers received inactive training through conferences.

AVIATION

The Air Corps Tactical School, which is soon to be moved from Langley Field, Va., to Montgomery, Ala., graduated 29 students this year, 14 from the Air Corps, 11 from other arms of the service, 3 Marines, and 1 foreign officer.

The Air Corps Technical School at Chanute Field, Rantoul, Ill., graduated 22 Regular and 3 Reserve officers from courses which covered armament, radio, maintenance, engineering, and photography. From enlisted men's courses in airplane mechanics, armament, welding, parachute rigging, photography, and radio, 661 men were graduated.

The Air Corps Engineering School at Wright Field, Dayton, Ohio, whose object is to standardize and develop instruction and training of Air Corps officers in the higher phases of air engineering, graduated 11 students in 1930.

GENERAL SERVICE SCHOOLS

The Command and General Staff School, Fort Leavenworth, Kan., which graduated 110 student officers in 1930, conducts a 2-year course thoroughly grounding selected officers in the principles of the command, staff, tactics, and logistics of large tactical units. The Army War College, at Washington, D. C., extends this instruction to mobilization, supply, and military operations on a large scale. From the War College, there were graduated in 1930 a total of 84 officers, 75 from the Army, 6 from the Navy, and 3 from the Marine Corps.

The Army Industrial College, Washington, D. C., trains Army officers for duties pertaining to the supervision of procurement of military supplies and of assurance of adequate provision for industrial mobilization in a national emergency. This work is confined to instruction in matters of general policy and the broader aspects of procurement activity. In the 1929-30 course, 37 officers were graduated.

RESERVE OFFICERS' TRAINING CORPS

Enrollment.—The Reserve Officers' Training Corps had at the close of the school year 1930 a total of 114,364 students, enrolled in 321 units located at 228 educational institutions in every state, the District of Columbia, Porto Rico, and Hawaii. Of these units, 218 were senior units with an enrollment of 73,030, and 103 were junior units with an enrollment of 41,334. At the end of the fiscal year, there were 778 commissioned officers, 15 warrant officers, and 924 enlisted men on duty as military instructors at civilian educational institutions. Six thousand seven hundred and seventy advanced course students attended summer training camps in 1930. During the five years ending with the school year 1929-30, there have graduated from the Reserve Officers' Training Corps 29,971 college and university students. Of the graduates from the R.O.T.C., during the five years ended with the school year 1929-30, 28,007 were appointed in the Officers' Reserve Corps, 27,451 accepted such appointments and there were outstanding 1,951 certificates for appointment issued to those who at the time of graduation were under the minimum legal age for appointment. Those appointed or granted certifications for appointment included, in addition to college and university students, graduates of essentially military institutions which do not confer degrees.

Citizens' Military Training Camps.—During the summer of 1929, there were conducted 53 camps at military posts to provide for military instruction and training of civilians and selected warrant officers and enlisted men of the Regular Army. As a result, 36,533 trainees completed the course, 22,388 taking the basic course, 8,621 the red, 3,729 the white, and 1,795 the blue. Of those graduating from the blue course, 65 were appointed second lieutenants in the Reserve Corps.

ADMINISTRATION OF VETERANS' AFFAIRS

By Frank T. Hines

Brigadier General, U. S. A.; Administrator

ADMINISTRATIVE CONSOLIDATION

The Seventy-first Congress, by an act approved July 3, 1930, authorized the consolidation of agencies concerned in the administration of the laws relating to the relief and other benefits provided for former members of the military and naval forces. By Executive Order of July 21, 1930, there was established the Veterans' Administration, which is subdivided into three administrative bureaus,—the Bureau of Pensions, the Bureau of National Homes, and the United States Veterans' Bureau, each under the immediate supervision of a director and under the general supervision of the Administrator of Veterans' Affairs. The Administrator of Veterans' Affairs is also chairman of the Federal Board of Hospitalization, which is advisory to the President in matters relating to the need for, the location of, and expenditures on account of increased Government facilities for hospitalization of veterans.

BUREAU OF PENSIONS

Functions.—The functions of the Bureau of Pensions are two-fold,—the execution of the laws granting pensions arising out of service with the United States military and naval forces, and the administration of the laws providing for the retirement of civil service employees.

Disbursements. — The disbursements for pensions during the first four months of the fiscal year 1931, from July 1 to Oct. 31, 1930, amounted to $74,898,320.82. Of the amount disbursed, $41,741,963.41 were paid out on account of Civil War service and $29,874,253.79 of Spanish War service. On account of service in Indian Wars, $1,495,235.67 were expended; War with Mexico, $119,093.33; Regular Establishment, $1,660,617.62; and to widows and soldiers who served in the War of 1812, of whom 10 are yet on the pension roll, $1,811.

Under the pension system dating back to 1790, the total disbursements up to October 31, 1930, have been $8,244,456,793.93, of which amount $7,411,603,977 have been paid out on account of the Civil War and $500,373,006 on account of the war with Spain. In the way of pensions, the Revolutionary War cost approximately $70,000,000; the War of 1812, $46,000,000; the war with Mexico, $60,000,000; and the various Indian wars, $46,000,000.

Pensioners.—The number of pensioners on the roll Oct. 31, 1930, was 460,437. Of these, 46,108 were Civil War veterans, 160,312 Civil War widows, 26 Civil War nurses, 188,555 Spanish War veterans, 28,843 Spanish War widows, and 454 Spanish War nurses. The roll shows 256,204 soldiers, 196,135 widows, 2,187 minor children, 871 helpless children, 4,560 dependent parents, and 480 Army nurses.

Claims.—The number of claims pending at the close of the fiscal year 1930 was 110,233. There were received during the fiscal year 1931, from July 1 to Oct. 31, 1930, 79,516 claims, and 135,690 claims were disposed of, leaving on hand at the close of October, 1930, 54,059 claims pending. Of the disposals, 3,870 were based on Civil War service, 124,555 on Spanish War service, 678 on Indian

War service, and 2,861 on disability or death due to other military or naval service. There was a marked increase in the number of claims pending and received, due largely to new and liberal pension legislation, especially affecting Spanish War veterans, enacted by the Congress toward the close of the fiscal year.

Pensionable Status and Rates.—An act passed by Congress June 2, 1930, provided an increased scale of rates for Spanish War veterans who served ninety days, eliminating from consideration in fixing rates of pensions the effects of vicious habits; it also gave a pensionable status to veterans who served seventy days or more but less than ninety days, and provided a scale of rates from $12 to $30 per month according to degree of inability to earn a support by manual labor. On June 9, 1930, the President approved an act providing a minimum rate of $75 per month for Civil War veterans and $100 per month for such as are in need of a regular attendant; also increasing from $30 to $40 per month the pension allowed Civil War widows of attained age of 70 years. On July 2, 1930, an act of Congress was approved extending the provisions of the general pension law to officers and enlisted men of the Coast Guard and their widows, children and other dependents. During the last session of the Congress, pension or increase of pension was granted to 3,731 individuals by special acts.

Civil Service Retirement.—The first law providing for retirement with annuity of civil service employees was passed May 22, 1920. Since that time the law has been amended several times. On May 29, 1930, a new retirement law was passed, practically superseding all prior legislation, effective July 1, 1930. This law reduces the age for superannuation of certain groups of employees, provides for optional retirement two years earlier in cases where the employee has rendered at least thirty years' service, and sets up a new method for computation of annuities which results in an increase of most of the annuities heretofore granted and provides more liberal annuities for those hereafter reaching retirement age.

Annuity Claims.—During the fiscal year 1931, from July 1 to October 31, 1930, the following original claims were adjudicated: based on age, 589; on disability, 248; 30-years' service, 258; involuntary separation, 25; making a total of 1,120 claims adjudicated. In addition, 14,698 annuity claims were readjudicated to allow increase under the act of May 29, 1930.

Annuitants.—On October 31, 1930, there were 18,468 annuitants on the roll, of whom 14,358 were retired for age, thirty years' service, and involuntary separation, and 4,110 for disability There were 404 annuitants dropped by reason of death during the first four months of the fiscal year 1931. Civil service employees to the number of 6,559, who had severed their connection with the Government service, made aplication for refund of deductions from their salaries for the retirement fund, and the claims of 6,163 were settled.

Operation of Retirement Fund.—On June 30, 1930, the balance in "the Civil Service retirement and disability fund" was $156,795,475.70. During the first four months of the fiscal year 1931, $9,842,670.99 were added to the fund, representing three and one-half per cent of the salaries of civil service employees. The fund was further increased by the addition of $534,992.82, interest and profits from investments, service credit payments, etc., and $21,000,000 appropriated from the general fund of the Treasury. There was disbursed from the fund in payment of annuities the sum of $5,083,129.25 and on account of refunds, $1,336,124.55. The balance in the retirement fund on October 31, 1930, was $181,753,875.71.

BUREAU OF NATIONAL HOMES

Organization. — The National Homes was originally created as an independent establishment by Act of Congress, March 3, 1865, for the purpose of providing a home for honorably discharged soldiers, sailors and marines who were so disabled by disease, wound, or otherwise as to be unable to earn their support and who were not otherwise provided for.

Branches.—The Home operated as an independent establishment from 1867 to July 21, 1930. During this time branches were established as follows: Central Branch, National Military Home, Dayton, O.; Northwestern Branch, National Homes, Wisconsin; Eastern Branch, National Soldiers' Home, Augusta, Me.; Southern Branch, National Soldiers' Home, Virginia; Western Branch, National Military Home, Kansas; Pacific Branch, National Military Home, California; Marion Branch, National Military Home, Indiana; Danville Branch, National Home, Danville, Ill.; Mountain Branch, Soldiers' Home, Johnson City, Tenn.; Battle Mountain Sanitarium, Hot Springs, S. D., and Bath Branch, National Home, Bath, N. Y.

Inmates.—Up to June 30, 1930, 248,027 members were cared for, and there were present in the Home receiving care on October 31, 22,747 members, of whom 15,474 were living in the barracks and 7,273 members were in the hospital.

UNITED STATES VETERANS' BUREAU

Functions.—The functions of the U. S. Veterans' Bureau are briefly as follows:

1. The adjudication of claims filed:
   a. For disability compensation (disabilities resulting from service).
   b. By dependents of disabled veterans for death compensation.
   c. By emergency officers for retirement pay.
   d. For disability allowance (disabilities not resulting from service).
2. The medical care and treatment of veterans.
3. The maintenance of insurance records of all veterans who have applied for insurance and are maintaining current premiums thereon, and the adjudication of claims resulting from such insurance.
4. The administration of the World War Adjusted Compensation Act.

Disability and Retirement.—Compensation is paid for death or disability resulting from injuries received, diseases contracted, or the aggravation or recurrence of pre-existing disabilities during or the result of military service in the World War. Retirement pay is paid to retired emergency officers for injuries received, diseases contracted, or the aggravation or recurrence of pre-existing disabilities during or the result of military service in the World War, provided the extent of disability is rated 30 per cent or more. Disability allowance is awarded to honorably discharged veterans of the World War who entered service prior to Nov. 11, 1918, served 90 days or more during the World War and are suffering from 25 per cent or more permanent disabilities not acquired in the service or the result of their own wilful misconduct.

Payments and Claims.—As of Oct. 31, 1930, compensation was being paid to 289,344 disabled veterans and to dependents of 92,908 deceased veterans of the World War. During the year ended Oct. 31, 1930, 72,365 new claims for compensation were received and approximately 345,000 adjudications effected. Monthly payments were made to 6,280 disabled emergency officers. As of Oct. 31, 1930, 242,521 applications had been received for disability allowance as authorized by the amendment approved July 3. Of this number, 59,204 had been adjudicated and 30,218 veterans awarded allowances ranging from $12 to $40 monthly, depending upon the extent of their disability.

Hospital Treatment.—In addition to compensation benefits, veterans of the World War with service connected disabilities are given medical, surgical, and hospital care. The director of the bureau may, when it appears necessary, supply disabled veterans with such appliances as wheel chairs, artificial limbs, trusses, etc. As of Oct. 31, 1930, the bureau was operating forty-eight hospitals, and beneficiaries of the bureau were also cared for in fifty other government hospitals and in 185 civil and state institutions. The total number of ex-service men and women who had received hospital treatment was 494,312, while 98,266 patients were admitted to hospitals during the year. The number remaining in hospitals utilized by the Bureau on that date is as follows :

	T.B.	N.P.	General	Total
U. S. Veterans'..	5,259	12,199	3,922	21,380
Other Government.	1,248	1,694	5,052	7,994
Civil and State...	431	1,341	384	2,156
Total	6,938	15,234	9,358	31,530

The Bureau also provides out-patient relief in clinics established in the field stations for veterans whose disabilities do not require hospital treatment. During the past year a total of 872,792 out-patient treatments were given, while 1,221,373 examinations were made outside of hospitals.

Guardianship.—It is incumbent upon the bureau to secure the appointment of properly qualified guardians and the removal of any who have demonstrated their unfiitness. Assistance is rendered to the next of kin in qualifying as guardians of beneficiaries and when no qualified next of kin is available, reputable banks and trust companies are utilized. The adequacy and solvency of guardian bonds is carefully investigated. Guardians are advised of the legal rights of their wards in order that incompetents and minors may receive all benefits to which they are entitled. Regional attorneys of the bureau, with the coöperation of service and welfare organizations, have been instrumental in reducing court.

Government Insurance.—United States Government Life Insurance is issued in any multiple of $500, not less than $1,000 or more than $10,000, upon the payment of premiums at a net peace time rate, with no extra charge for administration or excess mortality due to the hazards of war. The following forms of insurance are issued: ordinary life, 20-payment life, 20-year endowment, 30-payment life, 30-year endowment, endowment age 62, and 5-year convertible term insurance. The policies carry the usual values common to policies issued by commercial companies, such as extended insurance, paid-up insurance, cash surrenders and loans. Dividends are also paid from excess of interest earnings and savings in mortality. Under the original provision, yearly renewable term insurance was issued; however, legislative provisions required that all such insurance be converted into one of the permanent forms enumerated above not later than July 21, 1927. The following table shows a classification of the insurance in force October 31, 1930:

U. S. Government Life:	Number	Amount
Ordinary Life	138,342	$ 741,465,410.06
20-Payment Life ...	166,983	732,144,679.13
30-Payment Life ...	28,733	147,619,787.53
20-Year Endowment.	125,785	371,452,578.84
30-Year Endowment.	34,448	147,568,996.04
Endowment Age 62.	34,552	168,008,167.11
Extended Insurance.	20,733	62,537,427.00
5-Year Convertible Term Ins.	98,161	668,973,939.23
Total	647,737	$3,039,770,984.94

Adjusted Compensation.—Under the World War Compensation Act passed by Congress May 9, 1924, adjusted compensation is paid to veterans below the grade of captain in the Army or Marine Corps or Similar rank in the Navy and Coast Guard. The rate of pay for service in excess of sixty days is $1.25 and $1.00 per day and the amount is limited to $625 and $500 for overseas and home service respectively. Veterans entitled to not more than $50 are paid in cash and those entitled to more than $50 are given an adjusted service certificate in the form of a 20-year endowment insurance policy. Under costs, commissions and fees, a constant endeavor being made to keep such costs to a minimum. Social surveys of minors under guardianship are made semi-annually for the purpose of removing any unfavorable conditions. On Oct. 31, 1930, the bureau had under its jurisdiction 62,582 wards, of which 38,473 are minors, 23,003 are incompetent veterans, and 1,106 are incompetent dependents of deceased veterans.

Government Insurance.—United an amendment to the act, the bureau is authorized to make loans on the adjusted service certificates direct to the veteran.

The following table shows the applications for adjusted compensation received and adjudicated, together with the loans made under the act as amended, as of October 31, 1930:

	Number	Amount
Applications Received	3,753,216	
Applications Acted Upon:		
Cash Payments:		
Veterans ($50 or less) ..	126,199	$4,376,095.96
Dependents (less than $50)	7,110	192,530.00
Dependents ($50 or over)	100,610	35,654,289.00
Certificates..	3,478,956	3,514,021,927.00
$60 Lump Sum Payments		2,727,780.00
Total ...	3,712,875	$3,556,972,621.96
Death Claims approved on certificates matured by death of veteran	94,623	$95,758,359.00
Loans by the Bureau on Adjusted Service Certificates as of September 30, 1930..	2,523,125	$232,412,561.51
Cash collections ..		9,948,070.18

Disbursements.—The total disbursements made by the bureau or agencies now comprising it, exclusive of certain expenditures made for hospital construction under the direction of the Treasury Department, approximates $5,377,904,384.64, of which sum $4,462,301,255.22 was paid from appropriations may by Congress and the balance was received from allotments deducted from service men's pay and insurance premiums.

WATERWAYS AND HARBORS

BY LYTLE BROWN

MAJOR GENERAL U. S. A.; CHIEF OF ENGINEERS, WAR DEPARTMENT

INLAND WATERWAYS

Principal systems include the Great Lakes, New York Barge Canal, Hudson River, Mississippi River including Missouri, Ohio, Illinois and important tributaries, rivers of the Atlantic coast and intercoastal waterways and canals connecting them, rivers of the Gulf coast and intercoastal waterways extending from Pensacola, Fla., to Corpus Christi, Tex., connecting with all rivers and waterways emptying into the Gulf, San Joaquin-Sacramento system of California, Columbia system in the northwest and the smaller rivers emptying in the Pacific Ocean. These have been improved over sections and to depths in accordance with their commercial importance and commensurate with the benefits derived from them.

Channel Depths.—The Great Lakes are connected by channels from Superior to Erie, having a depth of 21 feet at standard low water. The River and Harbor Act of July 3, 1930, provides that these depths are to be increased to provide for the passage of vessels of 24-foot draft. The most important harbors have depths equal to existing channel depths. The Barge Canal which the Secretary of War was authorized and empowered by the River and Harbor Act of July 3, 1930, to take over from the State of New York, the intercoastal system from Trenton, N. J., to Wilmington, N. C., have depths of 12 feet. The Mississippi has a 9-foot depth to St. Louis and 6 feet to St. Paul. The River and Harbor Act of July 3, 1930, authorizes the construction of a channel with 9-foot depth to Minneapolis.

The Ohio now has a 9-foot channel throughout its length with 6 to 9 feet on its tributaries. The Missouri is being improved to afford a channel having 6-foot depth from its mouth to Sioux City. The Sacramento has a 10-foot project. Included in the intercoastal waterways is a channel which, when completed, will provide 6-foot depth across southern Florida *via* St. Luce River, Lake Okeechobee and Caloosahatchee River. Various other rivers and waterways have depths ranging from 7 feet or more to 3 or 4 feet. Others whose commercial importance is not so great have been improved simply by the removal of snags and other obstructions. The project depths mentioned above are the depths toward which the War Department is working. They have not yet been attained in all cases on account of limitations as to time and the availability of funds. However, work is progressing as rapidly as funds will permit. The appropriations for the work during the present year were increased by the sum of $12,000,000, made available by the First Deficiency Act, 1930, approved March 26, 1930. As a result, expenditures for River and Harbor Work for the fiscal year 1930 were approximately 30 per cent greater than the amount expended in 1929.

Inland Waterborne Commerce.—The corrected total of inland waterway commerce for 1929 was 245,894,000 tons, having a total value of $3,871,300,000. Estimates indicate that the savings made to the public from the reduced transportation charges on freight actually transported by water is equal each year to approximately 50 per cent of the cost to date of the improvements made. As a result of the extensive development of railway facilities throughout the country, particularly the construction of lines parallel to or along the waterways, there was a widespread decline in inland waterborne commerce generally throughout the country after these lines were built. The last decade has shown an increase in waterborne commerce over previous years, particularly the latter part of this period, which has witnessed a great increase in the freight transported on inland waterways. The more extensive utilization of our waterways is due to a number of causes. Among these is the realization that under suitable conditions as to the character of traffic origin and destination with respect to waterways, suitable channels, modern carriers and terminal facilities, water transportation is inherently cheaper than any other form. The increases of railroad rates, in recent years, has imposed a burden on lower classes of freight, some of which has been transported by rail without profit to the carrier. This condition has created a demand for more economical transportation. Waterways are particularly valuable for the transportation of raw products and commodities of low grade for which the economic necessities of the country demand lower transportation costs than railroads can afford.

Improvements in Facilities and Carriers.—Each year the tendency toward improvement of carriers and port facilities is evident; more modern, efficient carriers being put in service and additional modern terminals and trans-shipment facilities provided. This is particularly evident on the Mississippi and Ohio River systems. The Inland Waterways Corporation operates a barge line on the Mississippi to St. Paul and Minneapolis. Eighty-nine (89) other lines operate either as common or contract carriers on the Mississippi and Ohio System. In all, 478 Inland Waterway freight lines are in operation in the United States. The upper sections of the Ohio and its tributaries have had for years intensive traffic. Recent improvements were completed which provide 9-foot navigation available throughout the year from Pittsburgh to New Orleans. Large sums have been expended for the construction of modern floating plant and port facilities, and tonnage transported is rapidly increasing. There is a growing demad for the establishment of additional efficient common carrier service on the Mississippi and its tributaries, as well as on other important waterways.

Inland Waterways Corporation.—This corporation operates a fleet of barges and towboats on the Mississippi from New Orleans to Minneapolis, on the Warrior River in Alabama and over the intermediate sheltered intercoastal waterways. Freight transported includes low, medium and high grades. Operation, until recently, has not resulted in a material return on investment, due principally to lack of equipment and non-existence of joint railroad rates. Conditions are constantly improving in regard to the establishment of joint rates. During the calendar year 1929 the corporation handled 1,653,381 tons of commerce, of which 1,398,826 tons pertained to the Mississippi Division, and 254,555 tons to Warrior Division. A total of 78,152 tons was interchanged between the respective divisions and the total commerce carried by the line will exceed the total tonnage by a like amount. Savings to the public on tonnage transported by this corporation during 1929 amounted to $2,600,000.

NEW WATERWAY PROJECTS

Great Lakes.—By the River and Harbor Act approved July 3, 1930, Congress adopted a total of 174 projects for waterway and harbor improvement in the United States; 85 of these were for the improvement of rivers and canals; and 89 were for the improvement of ports and harbors. Included in the above are 17 projects for improvement of harbors and four for rivers and connecting channels of the Great Lakes System. These include both new and the extension of existing projects. Under the Act, the Secretary of War was authorized to take over and operate the Oswego and Erie Canals from the State of New York. These are to be kept and maintained as barge canals only and at present depths.

Intercoastal Waterways.—Further improvement was authorized on the intercoastal waterways, in the projects for extending the Atlantic intercoastal waterway from the Cape Fear River to Winyah Bay and the extension of the intercoastal waterway from Pensacola Bay, Florida, to Mobile, Alabama. Improvements were authorized to Gulf ports.

Mississippi System.—The Mississippi project has been increased to provide 9-foot navigation from New Orleans to St. Paul and Minneapolis. The Tennessee River is to be improved so as to provide 9-foot navigation, and the Illinois waterway is to be completed to provide the last link in the Lakes to Gulf waterway between the Mississippi and Lake Michigan.

PORTS

Northeastern Atlantic.—Portland, Boston, New York, Philadelphia, Baltimore, Norfolk and Newport News, of these and in fact of all United States ports, New York is greatest, approximately 25 per cent of our foreign commerce passing through it, as does the major part of our coastwise trade. A large percentage of the tonnage handled here consists of high grade package freight both from and to foreign and domestic ports. Ports of secondary importance are Providence and other New England ports whose principal commerce is inbound and consists of coal, lumber and petroleum products, and whose shipments consists principally of high grade package freight and manufactured products destined for New York.

South Atlantic.—Wilmington, N. C.; Charleston, S. C.; Savannah, Jacksonville, and Miami have a general commerce consisting of bulk commodities. Each of these ports is growing in importance and each year an increased tonnage passes through them.

Gulf of Mexico.—Mobile, New Orleans, Houston, Galveston and Texas City are ports whose commerce consists principally of grain, petroleum products, cotton and general commodities, and the Sabine ports which are oil shippers. Other Gulf ports include Fernandina, Tampa and South Boca Grande, from which large quantities of fertilizer are shipped; Key West, the car ferry port; Freeport, Tex., which ships a large tonnage of sulphur; Corpus Christi, Pensacola, Pascagoula, Gulfport and several others of lesser importance.

Pacific Coast.—San Diego, Los Angeles, San Francisco, Portland, Seattle and Tacoma have ever increasing amounts of foreign and domestic general cargo. At Los Angeles and San Diego a large item of commerce consists of shipments of petroleum and its products and receipts of lumber, with yearly increase in the general cargo handled. San Francisco is the principal port; through it passes a great portion of our commerce with the Orient. Portland has a large general cargo tonnage, and also handles large shipments of wheat, copra and petroleum. Seattle is the port where most of the silk from the East enters. To it come large cargoes of minerals and metals from foreign ports and from it wheat, forest products, and general cargo are shipped. Tacoma, whose principal receipts from foreign trade are ores and concentrates, handles flour, lumber and copper as its principal exports.

Great Lakes.—These include Duluth, Superior, Milwaukee, Chicago, Cleveland, Buffalo and many lesser ports. In addition to a large commerce consisting of general cargo, vast quantities of iron ore, grain and coal pass through them annually.

Ocean Port Depths.—The maximum depth that has been provided in harbor channels is 40 feet at mean low water, except in the channel through the outer bar of San Francisco where a depth of 45 feet has been authorized to afford safe navigation to deep draft vessels in the heavy swells there encountered. The depth of 40 feet has been afforded at New York Harbor and at other ports of primary importance to the Navy. While more than 90 per cent of the world's shipping draws less than 30 feet, yet to afford full, free and unimpeded navigation, a depth of 35 feet is provided at the principal harbors, and it may be said that for a port engaged in ocean shipping such depth is advisable when it can be provided at a cost commensurate with the volume of commerce.

New Ports Projects.—The River and Harbor Act of July 3, 1930, provided for the adoption of 89 projects for port improvements in the United States. Included in this number are new projects and extensions of those existing prior to passage of the Act. Construction of a 40-foot channel at Newport News, a 26-foot channel to Stockton, Calif., and the maintenance and extension of existing channel depths in existing projects has been initiated and carried on throughout the year. Twenty reports on proposed projects for major ports were submitted to Congress by the War Department during the fiscal year 1930, and all were favorable.

Port Facilities.—Plans of the Port of New York Authority, approved by Congress, provide for comprehensive coördination of rail and water facilities. Three belt line railroads are to be constructed which will provide connections between all railroads entering the area and the port terminals. The plan provides for a tunnel under the upper bay to connect the west and east sides of the harbor. During the construction period the Port Authority proposes the establishment of an organized motor transportation service to connect railroad and marine terminals. Port Newark, now an ocean terminal, has increased the facilities available to New York harbor. Additional facilities will be available when the terminals at Jamaica Bay are completed. At Philadelphia large modern piers and wharves have been constructed. Rail connections to these are such that cargo may be transferred direct between ships and railroad cars. As these piers are housed, excellent storage is provided where such may be required. New grain elevators and modern coal loading piers have recently been constructed here. Wilmington, Del., has a modern terminal with space for several ships. Extensive improvements have been made at Miami, Mobile and Houston; the last port, constructed at the head of an artificial channel, handles a large tonnage of oil, cotton and general cargo. Improvements to port facilities are general along the entire Pacific coast, particularly at Los Angeles, a comparatively new port but handling large tonnage. San Francisco, Portland and Seattle have also made extensive improvements and extensions to their marine terminals. Improvements have also been effected at Portland, Me.; Boston, Baltimore, Charleston, S. C.; Jacksonville, Tampa, San Diego, Richmond, Cal., and at Tacoma.

INLAND WATERWAY COMMERCE

Inland Waterways Improved By the Government. — The following shows freight traffic for 1929 of waterways under improvement by the Federal Government, excluding short deep stretches of river which are really approaches to ports.

Waterways	Short Tons	Value
Hudson R., middle stretch	6,724,101	$ 62,033,159
Hudson R., upper stretch	1,329,036	101,226,494
Delaware R., above Philadelphia	5,344,073	18,826,618
Chesapeake-Delaware Canal	709,095	45,545,239
Waterway from Norfolk, Va., to the Sounds of North Carolina	154,380	2,190,052
Inland Waterway from Norfolk, Va., to Beaufort Inlet, N. C.	664,391	28,207,143
St. Johns R., above Jacksonville	562,375	29,420,894
All others, Atlantic Coast	15,459,686	578,139,563
Tombigbee-Warrier System	1,962,164	44,568,815
Southern Louisiana Waterways (excluding Mississippi River)	4,302,716	70,307,563
All others, Gulf Coast	21,928,604	370,749,911
San Joaquin R.	941,139	42,759,858
Sacramento R.	1,128,768	74,088,210
Columbia R. and lower Willamette below Vancouver and Portland[1]	8,751,428	63,792,764
All others, Pacific Coast	16,390,008	152,633,414
Mississippi R. below Vicksburg (excluding ocean commerce)	3,431,055	156,898,115
Mississippi R., Memphis-Vicksburg	2,835,060	230,838,787
Mississippi R., Cairo-Memphis	2,328,334	150,050,769
Mississippi R., Minneapolis to Ohio River (Cairo)	1,390,262	85,793,392
Ohio River	21,955,148	192,308,473
Monongahela R.	28,907,614	166,121,576
Allegheny R.	3,783,558	10,912,693
Kanawha R.	1,532,264	7,514,796
All others, Mississippi System	11,954,250	135,048,749
All others in United States	112,830,198	$1,307,408,858
Total	277,299,707	$4,127,285,905

[1] Exclusive of ocean traffic.

Other Inland Waterways.—The following is for internal waterways other than those under improvement by the Federal Government:

Waterways	Short Tons	Value
New York State Barge Canal	2,876,160	$ 198,535,879
Lehigh and Delaware Division Canals, Pa.	261,888	1,397,717
Chicago Sanitary Drainage Canal	523,493	3,922,563
New Basin Canal, La.	292,702	3,549,614
All others of record	1,357,688	$ 75,600,483
Total	5,311,931	$ 283,006,256
Total, corrected for duplications because of commerce moving over two or more waterways	245,894,000	$3,871,300,000

TOTAL OF CORRECTED INTERNAL WATERWAY COMMERCE

Year	Tonnage	Value
1920	125,400,000	$2,814,600,000
1921	116,300,000	2,443,500,000
1922	111,800,000	3,177,900,000
1923	153,700,000	2,960,200,000
1924	173,200,000	3,446,000,000
1925	204,569,010	3,950,450,000
1926	217,000,000	3,680,000,000
1927	219,000,000	3,930,000,000
1928	227,300,000	3,838,000,000
1929	245,894,000	3,871,300,000

COASTWISE COMMERCE

Port	Tonnage, both ways	Value
Portland, Me. ...	2,350,583	$ 83,397,999
Boston	14,454,765	668,453,642
Providence	4,662,719	456,562,201
New York	42,661,514	2,437,238,202
Philadelphia	14,409,556	781,041,481
Baltimore	5,443,628	252,296,719
Norfolk–Newport News	19,228,216	571,088,087
All others, Atlantic Coast	27,986,229	$ 1,602,793,415
New Orleans	3,710,958	$ 192,904,597
Galveston, Houston, Texas City.	12,102,394	634,268,398
The Sabine Ports.	18,488,061	296,779,993
All others, Gulf Coast	7,777,859	$ 233,284,591
Los Angeles	20,491,966	$ 878,843,869
San Francisco Bay and Harbor	25,948,862	1,340,237,039
Portland, Oregon.	3,654,623	230,266,673
Tacoma	2,909,356	96,944,861
Seattle	6,824,563	472,765,870
All others, Pacific Coast	12,694,046	274,635,343
Hawaii, Porto Rico and Alaska	4,198,251	358,514,454
Total	249,998,149	$11,862,317,434
Total, corrected for duplications of "receipts" and "shipments" ...	124,999,074	$ 5,931,158,717

COMMERCE THROUGH PANAMA CANAL

(short tons)

	Intercoastal	Total
1921	1,372,388	11,599,204
1922	2,562,527	10,884,910
1923	8,068,553	19,567,875
1924	13,527,378	26,994,710
1925	9,496,259	23,958,836
1926	9,871,210	27,747,541
1927	11,365,592	31,078,000
1928	10,833,443	33,186,395
1929	11,084,212	34,342,567
1930	11,174,429	33,633,860

FOREIGN AND DOMESTIC COMMERCE OF PORTS DURING THE CALENDAR YEAR 1929

Grand divisions	Foreign				Domestic		Grand total	
	Imports		Exports					
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Atlantic coast	40,401,769	$2,492,755,948	19,372,216	$3,257,820,552	267,434,549	$16,545,992,831	327,208,534	$22,296,569,331
Gulf coast	7,040,241	268,704,463	18,471,061	1,153,119,646	51,906,780	1,616,644,885	77,418,082	3,038,468,994
Pacific coast	4,148,523	733,435,951	17,917,875	655,498,064	110,430,801	4,170,264,141	132,497,199	5,559,198,156
Greates Lakes	6,385,263	201,986,945	13,773,329	157,388,690	277,023,469	3,935,010,048	297,182,061	4,294,385,683
Grand total, unadjusted	57,975,796	$3,696,883,307	69,534,481	$5,223,826,952	706,795,599	$26,267,911,905	834,305,876	$35,188,622,164
Adjusted total, eliminating all known duplications	57,975,796	3,696,883,307	69,534,481	5,223,826,952	392,360,002	14,578,510,672	519,870,279	23,499,220,931

Commerce at other than ports, 1929

	Tons	Value
Adjusted total	63,929,721	$ 811,779,069

Total Commerce of the United States, 1929

	Tons	Value
Adjusted total	583,800,000	$24,311,000,000

STUDY AND SURVEYS OF RIVERS

For the purpose of formulating plans and determining methods for the most practicable utilization and control, and coördination of plans for improvement and maximum utilization in the best interests of the public and private interests concerned, an extensive inventory of the potential resources of our principal rivers is now being made by the Engineer Department. The study as authorized by Congress in the River and Harbor Acts of 1925 and 1927 provided for the examination, in connection with the Federal Power Commission, of those navigable streams and tributaries on which power development appeared feasible. The Mississippi River Flood Control Act of May 15, 1928, directed speedy prosecution of these studies and surveys and also directed the preparation of plans for certain flood control projects on tributaries of the Mississippi. As a result of these studies, to June 30, 1930, there have been 36 reports submitted to the Congress. When all studies have been completed, we will have an inventory of the possibilities of all of our more important rivers that are now navigable or may by improvement be made navigable.

NICARAGUAN CANAL SURVEY

Resolution No. 99, 70th Congress, approved March 2, 1929, authorized a survey for an Interoceanic Canal across the Republic of Nicaragua, under the direction of the Secretary of War and the supervision of the Chief of Engineers, with the aid of such civilian engineers as the President should deem advisable. President Hoover appointed the Interoceanic Canal Board and authorized sending a battalion of Engineer troops to Nicaragua to make the necessary investigations and surveys. The Board consists of Lieut. Gen. Edgar Jadwin, chairman; Col. Ernest Graves, retired; Sydney B. Williamson, Dr. Anson Marston, and R. G. Finch. The field survey is being made under the supervision of Major Dan. I. Sultan, Corps of Engineers, by a battalion of Engineer troops commanded by Major Chas. P. Gross, Corps of Engineers, and the operations include extending and checking the topographical surveys made thirty years ago, collecting additional hydrographic data, resurveying the harbors and making subsurface explorations to ascertain the best alignment and location for structures for a canal of greatly increased dimensions as compared with those proposed in 1901. Preliminary plans and estimates are being made for a canal of suitable dimensions for the larger commercial vessels and increased traffic of today and that which may reasonably be anticipated in the future.

MISSISSIPPI RIVER FLOOD CONTROL

Two years after the approval of the law enacted by Congress for the flood control of the Alluvial Valley of the Mississippi River, finds dirt flying from Cape Girardeau, Missouri, the head of the Valley, to New Orleans. Of the $325,000,000 authorized for the project almost $100,000,000 has been expended or obligated. The plan set forth in the adopted project proposes to protect the alluvial valley of the Mississippi, consisting of the St. Francis, the Yazoo, the Tensas (composed of the Boeuf and Macon Valley), and the Atchafalaya Basins, as well as the alluvial lands around Lake Pontchartrain, against the maximum flood predicted as possible. This is to be done by raising existing levees (with certain exceptions) about three feet and strengthening them greatly. North of the Arkansas River, floods will be confined generally to the main leveed channel but a limited area in the St. Francis Basin, in southeast Missouri and the City of Cairo, Ill., is to be given additional safety by a floodway between Birds Point and New Madrid, Missouri, which will, during extraordinary floods only, become an adjunct of the main channel and thereby widen the river and hold down stages. South of the Arkansas River flood waters in excess of what the leveed channel of the main river will safely carry will find their way to the Gulf through the lowlands of the basins west of the river, which have always carried extraordinary flood waters.

Protecting levees are to be constructed on the edges of these lowlands so as to restrain the waters within them and to protect the good lands outside. These protecting levees are to be located so as to reclaim the maximum amount of land that is economically justified, and where there are already such levees the project contemplates using the same levees but strengthening them. New Orleans is to be given additional protection by a controlled spillway at Bonnet Carre emptying into Lake Pontchartrain from the river above the city. During the last year about fifty-three million cubic yards of earth were placed in the levees being constructed in accordance with the adopted plan. The total project requires the moving of something like five hundred million cubic yards of earth. This is over twice as much earth as was excavated in building the Panama Canal. In addition to the levee work, revetments are being constructed to prevent bank caving and to protect the levee lines as well as to stabilize the banks in the interest of navigation. Contraction works for the purpose of improving the navigable channel are under way and maintenance dredging of this channel is also being done. Considerable progress has been made on the set-back levee of the New Madrid floodway and the Bonnet Carre Spillway construction has progressed satisfactorily to such an extent that this facility is nearing completion.

ORGANIZATION OF THE NAVY

BY WILLIAM LEDYARD RODGERS

VICE ADMIRAL, UNITED STATES NAVY

ADMINISTRATION

Shore Establishment.—Although the Navy does its work on the sea, it draws its men, ships, and supplies from the land and is directed by the President, who is its constitutional Commander-in-Chief. Consequently, the foundation of naval efficiency lies in a sound organization and administration of the shore establishment of the Navy. By authority of the Constitution, supplemented by legislative action, the President delegates his authority to the Secretary of the Navy, who, as the deputy of the President, maintains and operates the Navy, according to law and with the money appropriated by Congress. When the secretary is absent from his post, the law authorizes an assistant secretary to sit at the secretary's desk and operate the Navy as the temporary holder of the delegated authority of the President. Like every other business institution, the naval organization must provide for two main tasks. It must maintain itself in efficiency, and it must direct its effort wisely towards the objective for which it exists. In military phrase, the management of maintenance belongs to the Routine Staff; the direction of effort belongs to the General Staff, or as the American Navy calls it, to the Office of Operations.

Bureau of Navigation.—The maintenance of the Navy falls under two heads: (a) Personnel; (b) Material. The Bureau of Navigation deals with all matters affecting the enlistment, discharge, training, administration and discipline of the personnel of the Navy. It manages the Naval Academy, the Hydrographic Office, the Naval Observatory and the Naval Home for retired seamen. The Bureau is responsible for training individuals, but not for ship efficiency. Besides the training stations where recruits get their elementary naval training, the Bureau maintains various technical schools for electricians, machinists, torpedo and radio men, cooks, etc. In regard to officers, the Bureau manages the Naval Academy for Midshipmen, who are appointees of the President and of Congress. They are there trained in mathematics and the English branches as well as in the technical arts and sciences pertaining to the Navy. Midshipmen are also drilled in the use of the weapons and machinery used on ship-board. The Bureau fixes the proper couplements to man each type of ship, assigns individuals to specific duty and transports them when travel is necessary. The Bureau keeps the records of both officers and men.

Bureau of Medicine and Surgery.—Its duties are suggested by its name. It directs the hospitals and the medical work on board ship through the surgeons, dental surgeons, hospital-corps, and female nurse-corps of the Navy. (The last named do not serve on board ship.) Besides the care of the sick and injured, the Bureau supervises hygiene, both ashore and afloat. It examines physically all recruits before enlistment, and keeps medical records of all in the service for reference in case of disability and for the information of the Pension Office.

Materials Bureaus.—The four materials bureaus are Construction, Engineering, Ordnance and Aeronautics. The first designs and builds the ships of the Navy. The second is in charge of engineering including the design and manufacture of steam, electric and motor engines and of radio installations. Both of these Bureaus have experimental research stations to promote their efficiency. The Bureau of Ordnance designs and manufactures weapons and ammunition. The Bureau of Aeronautics is the newest of the Bureaus and is in charge of all types of flying vehicles and their equipment. An Assistant Secretary of the Navy has recently been authorized by Congress who coordinates the work of naval aeronautics with that of the Departments of War and of Commerce. The Bureau of Supplies and Accounts handles the finances of the Navy, pays the personnel, both civil and military, and makes all contracts. Besides it feeds and clothes the personnel and maintains the stocks of materials for itself and other Bureaus which must be kept on hand ready for routine use or for the emergency of war. All the above-named Bureaus need land and buildings to carry on their activities. The Bureau of Yards and Docks has charge of real estate. It designs, builds and maintains roads, shops, offices, hospitals, dry docks and other buildings on naval property. As all its services are rendered for the facilitation of the work of other branches of the Navy, it consults each of them in matters that concern it, and lays out its plans accordingly. All of these Bureaus have funds annually placed at their disposal by Congress which they disburse through the Bureau of Supplies and Accounts.

Judge-Advocate-General.—The legal affairs of the Navy Department are managed in the Office of the Judge-Advocate-General. This office is in two sections. The Solicitor is at the head of the civil division, which deals with matters of law such as arise in the conduct of business of every great corporation. The military branch supervises the legal part of the discipline of the Navy. All records of courts-martial go before it for review previous to action by the Secretary or the President if such is necessary. It supervises the naval prisons.

Navy Secretary's Council.—These various branches of the Department are coördinated by the Secretary's Council, at which the Chiefs of Bureaus and other officers periodically meet to discuss and arrange for current work. There is, moreover, the General Board, composed of certain ex-officio members and officers who have held high commands. This Board is charged with the ship-building policy of the Navy and is called upon by the Secretary for recommendations as to important matters of Departmental policy.

OPERATION AND MAINTENANCE

Naval Stations.—The physical work of maintenance of the Navy is carried on at Naval Stations numbering over two hundred, great and small, including technical schools, hospitals, barracks, shipyards, gun and munitions factories, magazines and depots for stores of all kinds, radio stations, research laboratories, purchasing agencies, etc. These establishments are mostly operated by civilian personnel and are directed from the Navy Department by the Navy Yard Division under the Assistant Secretary of the Navy. The principal naval stations are each industrially organized under a commandant, who carries on the work of construction, repair and supply of ships according to directions from the responsible Bureaus in Washington, who allot him the necessary sum for each task.

The Office of Naval Operations accepts ships, men and supplies from the maintenance side of the Department and works them up into efficient ships and fleets and uses them in peace and war to carry out the policies of the nation. The head of the office is the ranking officer of the navy, *ex-officio*. The office is organized in several divisions. The Training Division is in charge of all drills, target practice, steaming exercises and athletics. By a system of competition and observation it maintains efficiency in the fleet. The Office of Intelligence collects at home and abroad information useful to the Navy. It is aided by Naval attaches at the American legations abroad who report to the Department what is happening there as to naval affairs, and as to the status of the navy of each power. The Planning Section draws up plans for war under various conditions. Such plans usually go no further than the mobilization of the active and reserve strength, a concentration of force in some suitable locality, arrangements for supply and maintenance of the fleet and a decision as to the objective towards which the combatant effort will be directed. The Division of Material coördinates with the building Bureaus to arrange for repairs to ships in active service. The Division of Ship Movements manages the ships and fleets in commission. The Communications Office is in charge of all radio and telegraphic work. There is an Inspection Division and a Districts Division handling naval matters in different parts of the country, mostly affairs of naval reserves.

Naval Budget.—The financial estimates for the Navy are controlled by the Bureau of the Budget, which has its representative in the Navy Department. After receiving the President's orders, the Budget Officer allots to each Department the sum it is to have for the year. The Secretary, in council with the Bureau Chiefs, then allots to each of them a sum whose total will exhaust the allotment and a bill is prepared for submission to Congress, which controls the policy in a great degree, through its appropriations.

THE FLEET

Classes and Types of Ships.—A few ships take their orders directly from the Office of Operations but the great majority are members of squadrons or fleets. The largest command, known as the United States Fleet, is composed of all types of ships, both combatant and auxiliary, including battle ships, cruisers, torpedo boats, and submarines, besides ships for supply, repairs and hospitals. These ships, all under one Commander-in-Chief, are grouped in appropriate subdivisions under flag-officers who are responsible for drills, manoeuvers, efficiency and discipline of their respective commands. Thus the fleet is maintained in readiness for service, for even in peace some detachment may be called on to act in conjunction with the State Department in support of the foreign policy of the Administration.

Ship Organization and Functions.—Each ship is under the command of a captain who exercises authority over all on board, subject himself to the Navy Regulations approved by the President as Commander-in-Chief. The organization for battle is also that for carrying on the daily routine. The ship's company is distributed in divisions. The Navigator's Division handles the ship as a whole under the orders of the Captain. The helmsmen, leadsmen and lookouts compose it. The Engineer's Division is in charge of the steam, electrical and motor machinery. Several Gun and Torpedo Divisions handle the weapons of the ship. There is a Small-arms Division (usually marines) and an Airplane Division for Airplanes. A Fire-Control Division observes the enemy and directs the gun-fire with the help of observers in the airplanes. A Repair Division of Mechanics remedies damages in battle. The Surgical Division cares for the injured. A Signal Division communicates with other ships and the rest of the world by radio, visual and sound signals. The Commissary Division provides and cooks all rations. The Paymaster of the ship is the Commissary and also the General Storekeeper and Finance Officer. The general work of maintenance and repair is carried on by the different divisions, each of which is responsible for the good order and cleanliness of that part of the ship in the neighborhood of its own battle station. The divisional work of maintenance is supplemented as may be necessary by the mechanics of the ship's company.

MARINE CORPS

Duties.—There is within the Navy an important unit as yet unnamed, the Marine Corps. This is a body of soldiers forming part of the Navy. Marines do sea-duty on board the larger ships. They man part of the ship's battery and form the small-arms division and are a part or all of any landing force that may be sent away from the ship. When serving on ship-board they are an integral part of their ship's company, in no way in excess of the battle complement. The marines not doing sea-duty are organized as an expeditionary force for quick mobilization to seize an advanced base for the Navy in case of war. For this purpose the Expeditionary Force is organized like an army. Other marines on shore are quartered in military posts at the various naval stations, where they do duty as guards. The headquarter organization of the Marine Corps is under a Major-General Commandant, and is much like that of the Army except that it is not so entirely self-dependent as the Army. The marines draw their ammunition, small-arms, artillery, and medical service as well as some other services from the naval bureaus.

AVIATION SERVICE

It has been suggested to sever the aviation service from the army and navy and make it into an independent branch of the country's armament, and then to combine the three arms of army, navy and aviation in one huge organization of The National Defense. This project has not commended itself to the responsible authorities of the Government. It is alleged that some of the chief backers of the proposition are certain manufacturers who believe that such a step would increase business for them. However that may be, the air service must always operate in close conjunction with the army or navy as the case may be. Both need it as an important auxiliary to their own work. Moreover, should it be made an independent arm, it would immediately be obliged to organize round itself a military ground force, or a fleet to enable it to operate against the enemy. This happened to the British air force in Mesopotamia, where a considerable army has been made subordinate to the Commanding Air Marshall in order to permit the Air Force to maintain itself near the hostile area. There seems good reason to believe that the present status of the Air Force of the United States as auxiliary to the Army and to the Navy is better for the national defense than the independence which the Air Service enjoys in some foreign countries. Aviation is far from equalling the Army and Navy in importance. It must be remembered that in the great war aviation was new, and it owed much of its effectiveness to its novelty, for counter-measures were slow in developing. At present, in spite of all the improvements in air-craft technique, weapons in the air are probably less to be feared than in 1918, although, on the other hand, the air service will be an indispensable auxiliary in the next war, both to the Army and Navy.

COOPERATION OF ARMY AND NAVY

Joint Board of Officers.—The Administration does not believe that military efficiency will be increased by uniting the Army and Navy in one military structure, on account of the added complexity of management which is already sufficiently great. Nevertheless, both army and navy have long been aware that modern war demands a greater measure of coördination than was customary in the past, and steps have been taken to provide for it without merging the two Departments. In 1903 the Secretaries of War and of the Navy established a joint Board of officers of the two services to coördinate the action of the two services where it seemed desirable. The matters cognizant by this Board and its procedure were revised in 1919. It is without executive authority, but when its recommendations are approved by the Secretaries (sometimes the President must approve) they become effective. The Board has prepared regulations for the joint action of the Army and Navy and of their air components when coöperating in war. This coöperation is carried further by local Joint Committees representing Army Corps Areas and their corresponding Naval Districts which take cognizance of local subjects and report to their respective Chiefs as to appropriate action. There is also a Joint Aeronautical Board to investigate and report to the Secretaries of War and of the Navy upon questions jointly affecting the development and employment of aviation of both services. There is also an Army and Navy Munitions Board which coördinates the plans for acquiring munitions and other supplies needed for war purposes, so that the supply agencies of the two services will not conflict. The organization of the Army and Navy for joint action under the supreme command of the President as constitutional Commander-in-Chief is thus provided for without resort to centralization by legislation.

FUNCTIONS OF THE NAVY

By William Ledyard Rodgers

Vice Admiral, United States Navy

THE NAVY IN PEACE

Freedom of the Seas.—The function of the Navy is the defense of the United States, not only of the actual territory of the country and its coastal waters, but also of its policies and ideals. The navy preserves us from the necessity of accepting the dicta of other nations with other ideas of propriety. It protects the conscience of the nation and its freedom to do right as it sees the right and not as others choose to see the right for it. Some policies such as immigration, which we regard as domestic, other nations think affect them unfavorably and regard as international. Chief among the national policies which the Navy defends is that of the "freedom of the seas" and American commercial rights, both in peace and war. Our commerce extends to every quarter of the globe and, including our domestic commerce in transit on the high seas as well as our foreign trade, its value is even greater than that of Great Britain, which led the world some years ago and still leads in amount of shipping under the national flag. It is this huge ocean-borne commerce of the United States and the American ships which carry it that the American Navy protects. A century ago this country had a great merchant fleet, but the other element of sea-power, a strong navy, was lacking, and because we could not protect our trade we fell into the disastrous war in 1812. Now, we are again developing a large merchant fleet for the advantage of our business, and the means for its protection must not be neglected. In spite of the Kellogg Pact, which renounces "offensive war" on the part of its signatories, the great nations of Europe give little evidence that they believe the promise of the Pact is a sure defense. They are prepared for war. If and when such a war unfortunately comes, the United States hopes to be neutral and yet to preserve her freedom of trade (the freedom of the seas) which is so essential to her national prosperity. For the maintenance of this right a strong navy is the best security.

Foreign Trade Protection.—The reason for maintaining sea-power is a simple one. As a neutral in time of war the prosperity of this country depends on the maintenance of our foreign trade. We send abroad about 10 per cent of all the products of our industries, and the greater part of these are ocean borne. If the free movement of these products should be checked, the industries of the country would be correspondingly reduced and national distress would take the place of prosperity. We cannot depend on other countries to carry our products for us, because, when nations go to war, those of them who are maritime powers need their merchant shipping for their own belligerent purposes. Neutral nations who depend on belligerents for transportation services will find themselves obliged to submit to onerous terms; if indeed, they get any service at all. An American merchant fleet proportional to the country's great stake in international trade is therefore essential to the preservation of American industry in time of war. It will be recollected that at the opening of the World War in 1914, business in this country was much disturbed and the railways were blocked, after the belligerents had withdrawn their ships, because the sea-ports could not discharge their docks of accumulated freight, owing to lack of American vessels. But even if we have an adequate merchant fleet, it could not by itself maintain neutral freedom of the seas for the advantage of American commerce. When war exists, no mere law without a navy will protect commercial rights due under international law. When hostilities arise, the belligerents withdraw a great part of their workers from industry and at the same time their economic requirements are much increased by the demand for war supplies of every kind. Both belligerents thus find themselves forced to borrow money as they can, and to rely on neutral imports to carry on the war. Moreover, since trade with neutrals is essential to both belligerents, each will feel the necessity of preventing the enemy's access to neutral markets and of attacking shipping which aids him, even if it belongs under neutral flags.

INTERNATIONAL ASPECTS OF DEFENSE

Historical Retrospect.—This is the point which has made difficulties for the United States almost from the day of the establishment of the nation, and which has twice driven the country to war because powerful belligerents have refused to consider our verbal remonstrances. During the Napoleonic Wars and again in 1914-15-16 this country protested in vain that innocent cargoes destined for private persons should not be interfered with. We believed in 1812, as we believed in 1917, that only those American products meant to support the armies in the field were properly contraband goods and therefore liable to capture. But the powers at war would not accept this view. Finally, in each case this country went to war because the rights of its people and of its trade could not obtain respect from belligerents struggling for national existence. Should the Kellogg Pact unfortunately be broken, our business would be seriously affected.

League of Nations.—The Covenant to the League of Nations expressly provides that should any nation commit an act of aggression the members of the League will thereupon inflict the penalty of boycott, to be enforced by the navies of the maritime members of the League. The United States is not a member of the League and, in such an event, may not wish to submit to its decision, but it will be obliged to do so if it has no adequate naval means of supporting its diplomatic stand. In the present situation of international politics, it is apparent that a powerful navy is the chief means available to the League of Nations for enforcing its views with regard to any recalcitrant member of the League, particularly because the application of blockade to reduce an opponent is not so ruthless as that of military means. On the other hand, the United States, not a member of the League, must rely on its Navy if it is to preserve its ability to act as it sees fit and control its own commerce in time of international stress. As in all matters of negotiation and mutual adjustment, the principal inducement to conciliation and compromise is the strength of the other party's position, it follows that whether the United States is in or out of the League, the existence of several powerful navies balancing each other, including that of this country second in strength to none, is one of the best guarantees of world peace rather than a provocative to war. The causes of war are not to be found in armaments, but in the economic rivalries between great nations which lead to war for their solution. During general peace, the function of the American navy is to be seen as a conservative influence supporting the desire of the people of the country to preserve the peace of the world. It serves as a warning to other countries not to break the peace.

THE NAVY IN WAR

Protecting Sea Traffic.—Should our country be at war the chief function of the Navy will still be the protection of the national traffic on the high seas. The productive capacities of the national industries will be in great measure diverted to the manufacture of war supplies of every kind and the needs of the people as well as the requirements of war demand unusual reliance upon imports. During the Civil War, the United States developed the doctrine of continuous voyage whereby goods on the high seas intended for enemy consumption could be held as lawful prize even if their immediate destination was some neutral port. In the recent war this doctrine was extended by Great Britain. In the future we may expect our enemy to strike remorselessly at our sea-borne commerce wherever found, and we shall do the same to him. The duty, the function of our navy is, therefore, to deny the enemy the use of the sea for both military and civil traffic and keep it open for our own use for the supply of the armies as well as for that of the general public. For this object battleships are necessary to secure a free field for the cruisers in their operations against hostile trade. It should be realized that combatant ships fight not so much for the immediate object of overcoming each other, as for the ulterior object of destroying protection to the hostile commerce which nourishes the war on shore. Commerce has always been the final objective of naval efforts, and will still be so.

Coast Defense.—A third but subordinate function of the navy is that of coast-defense. This will be substantially accomplished by a navy adequate for commerce protection, for an enemy cannot gain access to our coasts in any great strength, unless he has overcome our main fleet, but nevertheless it would be imprudent not to provide local defense. For this purpose, submarines are particularly suitable, since submarine attack is very effective when the raiding enemy appears for undertaking coastal operations, or landing troops.

NAVAL CONSTRUCTION

By Peter Bain

Editor, *American Shipping*

INTRODUCTORY

A restless year may well describe the public attitude during 1930 towards naval policies and problems. Otherwise expressed, it was an unsatisfactory year in so far as determination and adoption of a construction program was concerned, notwithstanding that the circumstance and findings of the Conference on Naval Disarmament in London provided the needful and logical opportunity for its initiation and practical manifestation. Yet, something was gained. Public interest in naval affairs became more widespread and keen and, incidentally, more actively militant in expressing itself; linking up to and taking sides as it did on lines previously drawn, and between which sharp and apparently irreconcilable differences exist as to what should be the nature and extent respectively of United States naval policy and its co-related defense and offense equipment,—personnel, ships, guns, etc. The old controversy as to the need of a big and powerful navy in its every detail, and equal to any call that may be made upon it,—defense and offense—or one of reasonable defense classification only,—became intensified immediately the London Conference was mooted, and that condition is likely to prevail unabated until Congressional action is taken. This is expected as soon as hearings by the House Naval Affairs Committee have been concluded, and the evidence weighed. If, then, nothing abnormal developed relative to our naval expansion and maintenance, it may at once be said that the standard of fitness in all departments suffered nothing by comparison with preceding years. Thus, while there was an evident disposition to await in some measure the result of the London Conference, preliminary and research work, preparation of plans and specifications, steady application to new construction against scheduled dates of completion and commissioning; modernization likewise, projected or in process; repair and upkeep, decommissioning and scrapping of class and type vessel as the case might be, were quite consistently practiced. Whatever, therefore, Congress may direct in line with the Treaty findings or privileges arising out of the London Conference, it may well be inferred that the Navy Department is equipped and ready to act promptly in converting instructions and appropriations into visible and tangible additions and improvements.

LONDON NAVAL CONFERENCE

Disarmament Values Appraised.—On Jan. 21, 1930, King George V of Great Britain welcomed officially to a Naval Conference in London the delegates and aides of five of the world's leading maritime nations. Reduction of naval armaments,—ships of war and equipment, offensive and defensive—was the objective sought. The United States was ably represented. An understanding arrived at between President Hoover and Prime Minister Ramsay McDonald was expected to contribute much toward worthwhile accomplishment at the Conference. Following Mr. Mac Donald's visit here with its concurrent issuance of the Conference call, much ink began to be spilt and heaps of opinion, expert and otherwise, voiced gratuitously to demonstrate not how much might and should be accomplished, but rather how meagre, if any, was likely to be any realizable achievement. The general trend of the various opinions presupposed that reconciliation of the views and aspirations of five of the world's leading naval powers was altogether impossible in any direction, hence not only an implied futility of the Conference but its more than probable aftermath of reckless armament increase and expenditure, and greatly intensified national rivalries. The welcome to the delegates was spectacular; yet, it was neither patronizing nor persuasive in any one particular direction. The Disarmament Conference that met in Washington in 1921 also registered a spectacular opening ceremony, but it portended a great deal more than a mere gesture of international good-will. It became, immediately, both patronizing and persuasive through the presentation by us of a series of carefuly formulated and eminently practical proposals, all of which bore the hallmark of sincerity and, as well, gave indication of our willingness to disregard the opportunity then available to act contrariwise. Thus before the

1921 Conference sessions had well begun, it seemed highly expedient just then to let well enough alone,—stand on the announced capital ship proposals and designate the Conference a huge success; in effect, declare a construction holiday until 1932, do some capital ship scrapping and, agree to the adjustment of a few numbers, sizes, tonnages and armament details of cruisers, destroyers, submarines, and airplane carriers.

Accomplishment. — The Washington Conference, despite its rather one-sidedness, established a precedent. It demonstrated that armaments could be limited by agreement; thus, the London Conference, with that as a basis, sought to affirm the precedent, and generally and generously to widen its scope. Free-will offerings of submergence of national aspirations and ambitions,—the course we adopted at Washington,—were conspicuously absent at London. The Conference completed its deliberations ahead of the probable date set and a Treaty of "sorts" was signed by delegates of the United States, Great Britain and Japan. Later it was ratified by these respective governments. France and Italy, relative to themselves, could not agree on a ratio satisfactory to each, therefore they were not signatories to the Treaty. Something, apparently was accomplished but, whether there is much of intrinsic value to it, time must be left to tell. It is abundantly clear that the Conference achieved little relative to the purpose for which it was called. Thus, probably, the most that can be said of its accomplishment is that it saved its face, just missed being another Geneva of a few years back. We certainly gained nothing that we did not previously possess or were not in a position to achieve. Reduction and limitation were the main objectives of the Conference. In addition, we sought, and had planned to secure, parity with Great Britain; but who shall say that this has been or will be achieved before the next Conference convenes in 1936? True, a battleship construction holiday for a brief period of years and the scrapping of a few obsolete or near-obsolete ships of that class have been agreed upon. A battleship construction holiday, however, hardly warranted a five- or three-power Conference for the reason that battleship promotion by any sea power today is wholly *passé*. Our cruiser program has been revamped, yet while it may later be the equivalent of, or in a parity with, that of Great Britain, undoubtedly we have sacrificed something. Destroyers, submarines, and airplane carriers figure in the Treaty, each being ostensibly expressive of British parity five years hence and Japan's related ratio.

Disappointments of Conference.—The Conference made war no less possible. It simply readjusted a trio of basis ratings. It did not, as was believed to be within its deliberative scope, contribute one jot or tittle towards greater efficacy of the Kellogg Pact, the League of Nations or the World Court. Thus, while judgment may fairly be withheld for a year or two as to its beneficent effect on taxation, it is abundantly evident, should Congress decide to build up to Treaty parity with Great Britain, that a round $1,000,000,000 of public money will have to be spent between now and 1936. Such an eventuality looks not unlike increased taxation. In any case it is hardly prophetic of reduced taxation, yet some such prospect was cherished. The Conference was a disappointment to those who looked for substantial limitations,—a scaling down of the British status instead of building up to it; however, competitive building to a degree has been stopped. Again, it is optional on our part to build up to the agreed parity. Further, it may yet be, even by building up as privileged, that we will spend less than we might have done had there been no Conference and no limiting Treaty. Only, therefore, after Congressional action has been taken will the expense feature be available for comparison, and assessment of the Conference advantages and disadvantages be admissible for impartial accounting and striking of the balance. Taking the Treaty as a whole, however, and having regard to the certain impossibility of achieving British parity through agreement on any other basis than that of naval craft, ratification was thoroughly logical, imperfections real or imaginary notwithstanding. After all, the mere name—parity—number, size, tonnage, speed and armament of naval vessels, means little or nothing of value if unaccompanied by a genuine intention and expectation of keeping the peace instead of going to war. As a result of the Franco-Italian deadlock, the United States, Great Britain and Japan protected themselves against a possible competitive building program on the part of both France and Italy by inserting an "escape" clause, the essence of which is that if and when such competitive building becomes active, and therefore menacing to the preservation of Treaty ratios, it shall be permissible for the respective signatories to take the necessary steps to maintain their Treaty-determined relative status.

CURRENT CONSTRUCTION

Light Cruisers.—Ten ships were listed as under construction on July 1st, 1930, consisting of 8 light cruisers and two fleet submarines. Of the 10,000-ton light cruisers authorized by the Act of Dec. 18, 1924, only three remained uncompleted on June 30, 1930,—the *Louisville*, *Chicago*, and *Augusta*. Completion of all three is expected well ahead of the contract date, March, 1931. Those delivered and commissioned during 1930 consisted of the *Salt Lake City*, *Pensacola*, *Northampton*, *Houston* and *Chester*. Under construction as per formal awards made July, 1929, are the first group of five of fifteen light cruisers authorized by Act of Feb. 13, 1929. Three are building in Navy Yards,—the *New Orleans*, *Astoria*, and *Minneapolis*; and two,—the *Portland* and *Indianapolis*—in private shipyards. In October an order was placed with the Mare Island Navy Yard for construction of another cruiser of like class and type. This 8-inch gun, 10,000-ton vessel is the first of the second lot of five of the group of fifteen already noted. Here, it may be pointed out, that the third block of five was eliminated by the London Treaty which allows us 180,000 tons of this class and type,—18 in number—instead of the 150,000 tons we had projected,—15 in number.

Fleet Submarines. — Cruiser-type fleet submarine *V-5* was placed in commission May 15, 1930, and its sister ship, the *V-6*, July 1, 1930. The *V-7*, also a cruiser-type fleet submarine for which the keel was laid June 14, 1930, was 15.5 per cent completed on Sept. 30.

Aircraft Carrier. — Contract for building the navy's new $19,000,000 aircraft carrier was let in October to the Newport News Shipbuilding and Dry Dock Co. She will be the first of the Navy's carriers designed from the keel up for aircraft work with the fleet. The *Saratoga* and *Lexington* were designed as battle cruisers and, under the provisions of the Washington Treaty, were converted into aircraft carriers. The London Treaty allows 135,000 tons of aircraft carriers to both the United States and Great Britain. Completion of the ship contracted for will bring the American tonage to 79,800. The carrier *Langley* is not included in the Treaty total, since that vessel is of the experimental type and replaceable at any time Congress sees fit to vote the money.

NEW CONSTRUCTION PROGRAM

Plans for New Ships.—Preparation of contract plans for the group of light cruisers Nos. 37 to 41 was undertaken during the year. Plans for aircraft carrier *CV-4* were completed, as were contract plans for submarine *V-7*. Considerable work was done on plans for the modernization of the battleships *Mississippi*, *Idaho* and *New Mexico*. Again, many studies were made of the various types of ships, construction of which is permitted under the London Treaty, the type vessels embracing 8-inch and 6-inch gun cruisers, 6-inch gun cruisers with flying deck, leaders, destroyers and submarines. A series of tests of electrically welded specimens was also initiated at the Washington Navy Yard, with the purpose of securing basic data on which to issue to the service standard specifications for welding procedure, and to revise existing instructions. This is now a matter of great importance in view of the rapid extension of welding to ship construction.

One-Year Program. — The first step toward construction of the new American battle fleet authorized by the London Treaty was taken Dec. 8 when the House of Representatives received from its Naval Affairs Committee a Bill containing President Hoover's building program for next year, calling for new ships costing approximately $130,000,000. With $30,000,000 for modernization of the battleships *Idaho*, *New Mexico* and *Mississippi*, $5,000,000 for additional airplanes to operate with the Treaty fleet, and $5,000,000 for the new Pacific Coast dirigible base, the naval program that Congress is asked to authorize represents an ultimate outlay of about $170,000,000. The one-year program set forth in the Bill asks authorization for the following new construction: one cruiser, 7,500 tons, six-inch guns, $16,605,000; one cruiser, 10,000 tons, with an experimental flying-off deck for airplanes, six-inch guns, $20,780,000; one airplane carrier, 13,800 tons, $27,650,000; ten destroyers and one destroyer leader costing $47,000,000; four submarines, 1,100 tons each, costing $17,600,000. The new airplane carrier will be equipped with 114 planes, the cruiser with the flying deck 36, and the smaller cruiser with six, all of which are provided for in the $5,000,000 which is sought to take care of airplane construction. Coincident with the introduction of the Administration's first Treaty Fleet Bill, the Senate passed without debate the Bill authorizing $30,000,000 for modernization of the battleships *Idaho*, *New Mexico* and *Mississippi*.

Treaty Impingement.—If the United States builds up its combatant units to the strength fixed by the London Treaty, the cost will be about $1,100,000,000 and if the air program is added the total will be $1,250,000,000 according to an estimate of Admiral William V. Pratt, Chief of Naval Operations, transmitted Dec. 20 to the House Committee on Naval Affairs. The Navy Department it is understood has agreed on a time limit of ten years to reach the Treaty limit, or five years in excess of the life of the London Treaty, which expires at midnight, Dec. 31, 1935. The House Naval Affairs Committee is believed to be almost unanimous in opposing the construction of more 6-inch gun cruisers in view of the statement by Admiral Pratt that in his opinion the Navy had enough vessels of that class for the present. On Dec. 22, Admiral Pratt served notice in a further memorandum that both Great Britain and Japan had committed themselves to extensive naval building programs although each is nearer to the London Treaty limits than is the United States. The British program calls for the construction of 220,000 tons of ships before expiration of the Treaty.

FLEET MAINTENANCE

Battleships, Airplane Carriers, Cruisers.—The number of ships in the active fleet on June 30, 1930, was two more than at the end of the preceding fiscal year. The policy of restricting repairs to those absolutely essential for safe and satisfactory operation was again in evidence. Battleships on which repair and installation work of a varied nature was undertaken included the *Tennessee*, *California*, *Maryland*, *West Virginia*, *Texas*, *Arkansas* and *New York*. During regular overhaul periods, the airplane carriers *Lexington* and *Saratoga* had such of the remaining items attended to as were recommended by the Trial Board in so far as these could be accomplished with the funds available. Due to considerable working of the blister structures of the two vessels in a seaway and large leakage in way of the blister void, it was found necessary to strengthen the blister framing. On the *Langley*, alterations were made on the gasoline system which increased the rate and safety with which planes can be fueled on the flight deck. Light cruisers on which repairs, alterations and additions were made included the

Marblehead, Detroit, Memphis, Raleigh, and *Richmond.* Decommissioning and recommissioning of 53 destroyers and 4 light mine layers was undertaken by the forces afloat with certain assistance from the destroyer base at San Diego, the Mare Island and Philadelphia Navy Yards. This program was induced by the condition of the decommissioned ships' boilers.

Submarines.—With the exception of changes to insure safety and facilitate salvage, improvements to submarines were confined to those of a relatively minor character. On 25 submarines of the *S*-class it was found necessary to convert a portion of the main ballast tanks into fuel tanks in order to maintain satisfactory stability after the addition of the weight required by the above changes. The experimental submarine hulk *S-4* continued the testing of certain other devices during the year, principally marker buoys and diving bells, and also was engaged in training submarine personnel of the control force in the use of the submarine escape appliances. Experiments with submarine escape apparatus were continued by the diving unit at the Washington Navy Yard, simulating as closely as possible all conditions attendant on submarine escape. Under such conditions, ascents were made from a simulated depth of 370 feet. All submarines are now furnished with two sets of submarine escape apparatus (lungs) per man, plus 10 per cent spares, the total being divided equally between the forward and after compartments.

Battleship Modernization. — The *Oklahoma* and *Nevada* rejoined the fleet on Jan. 3 and Jan. 4, 1930, respectively, on completion of their post-trial overhauls. Work being undertaken on the *Pennsylvania* and *Arizona* is similar in general to the work undertaken on the *Oklahoma* and *Nevada,* and consists of the installation of additional protection against submarine and air attack, reboilering and the installation of new cruising turbines, elevation of turret guns, the raising of certain of the secondary battery guns, replacement of the present anti-aircraft batteries by batteries of 5-inch anti-aircraft guns, installation of new masts and modernized fire control, and such miscellaneous repairs and alterations as are necessary to place them in up-to-date condition when they return to the fleet. In addition, there is being installed on the *Pennsylvania* a protected flag battle station similar to the one installed on the *California.* Both ships are scheduled for completion by March 1, 1931. With completion of the *Pennsylvania* and *Arizona,* the modernization of 10 of the 18 battleships in service will have been completed. Modernization of the next three,—the *New Mexico, Idaho, Misissippi,*—has been authorized by Congress.

NAVAL AERONAUTICS

By William A. Moffett

Rear Admiral, U.S.N.; Chief, Bureau of Aeronautics, Navy Department

PROGRESS OF FIVE-YEAR BUILDING PROGRAM

Satisfactory progress is being made toward the completion of the Five-Year Building Program for naval aviation as authorized by Act of Congress, approved June 24, 1926. This Act authorized an increase in useful airplanes to 1,000 in five yearly increments. At the beginning of this program, the Navy had on hand 351 useful airplanes. On July 1, 1927 there were 468; on July 1, 1928, 624; on July 29, 1929, 829; and on July 1, 1930, 928. The last appropriating year contemplated by the Act is the one ending June 30, 1931. It is expected that the aircraft to be procured under the 1930 and 1931 authorizations will raise the number of naval airplanes on hand to 1,000 during the fiscal year 1932.

FLYING HOURS AND SAFETY RECORD

In the interest of improvement in safety in flying, the Bureau of Aeronautics maintains a detailed record of all failures of material and of all accidents. Each such occurrence is analyzed on the spot by a board of three officers, who submit findings of fact, express their opinions as to the cause and make pertinent recommendations. These reports and records enable the Bureau to take such steps toward the elimination of material faults and make such recommendations for the control of improper flying and personnel derelictions as will best contribute to safety in aviation and yet not restrict the employment of aircraft in the proper development of this new art of naval warfare. During the past year a total of 266,984 hours were flown by naval airplanes with but 14 fatal accidents and 18 fatalities. For every fatality there were thus flown a new record total of 14,832 hours, and for each fatal accident 19,070 hours. These figures compare with the previous best records made in 1929 of 6,773 and 11,289 hours respectively. This new record may also be expressed by stating that in a total of 252,095 flights during the past year only 14 resulted in fatal injuries to occupants of the aircraft, or in other words, flights in the Navy were 99.9945 per cent safe from fatalities.

DEMONSTRATION OF AIRCRAFT CARRIERS

The year opened with the Fleet's annual cruise in southern waters. Three aircraft carriers participated,—*Saratoga*, *Lexington* and *Langley*. Two major problems were fought in the Caribbean Area, during which the aircraft squadrons of the Fleet were used to an extent hitherto unequaled due primarily to the accrued knowledge of the effectiveness and reliability of the Navy's aircraft. The absence in these problems of the usual number of destroyers and the small number of light cruisers threw almost the entire burden of scouting on carrier based aircraft. The problems demonstrated the tremendous advantage which lies with the Fleet that has control of the air. Normally basing on the Pacific coast, the aircraft carriers, upon completion of these exercises, visited the Atlantic seaboard in order that the East might see at close range our efficient sea-going naval aerial force. Approximately 150 airplanes from the carriers flew from Norfolk, Virginia, over Washington, Baltimore, Wilmington, Philadelphia, New York, Providence, Boston and intermediate cities and returned to their floating airdromes without a single major casualty to either personnel or material. During the latter part of August the Navy and the Army held joint exercises in connection with an attack upon the defenses of San Francisco. In both services, aircraft played the major roles in these exercises. During the autumn the patrol squadrons of the Fleet were used satisfactorily for night search operations in fleet tactical exercises. During the year the Navy despatched planes to Alaska, to Florida, to Southwest United States, and to Santo Domingo on errands of mercy in the interest of humanity. Searches for the lost ships and persons were conducted over the Great Lakes, to Atlantic and the Pacific Oceans.

MARINE CORPS AVIATION

Marine Corps aviation operations in 1930 were conducted at Quantico, San Diego, Haiti, Nicaragua and Guam. As in 1929, the Marine Corps aircraft squadrons in Nicaragua continued to demonstrate most effectively the employment of aircraft in minor warfare. In practically all kinds of weather and under the most trying and dangerous circumstances these aircraft squadrons carried out numerous missions of inestimable value to the main expeditionary force. Their duties included not only observation and reconnaissance but actual attack of opposing forces by machine guns and bombs from planes. Provisions which would have taken weeks to transport over the wild Nicaraguan jungles, were transported in as many hours by aircraft. Highly valuable information under fire was transmitted between ground forces and air forces with great reliability. On several occasions seriously wounded troops, who might otherwise have perished in those tropical jungles, were carried out to safety by airplane under fire, and the lives of others saved by the delivery of vital medical supplies. And probably, unique in history, airplanes played a role valuable to the morale of the troops in the field by delivering over $500,000 of pay-day money to the remote commands in the jungles that could not be reached by the paymaster on foot.

CONSTRUCTION AND EQUIPMENT

Wood Elimination.—The past year has witnessed further progress in the elimination of wood from aircraft structures. No new construction for several years has used wooden fuselages and the passing of 1930 carried with it the last of the wooden fuselage airplanes of the Navy. Wooden wing ribs and wooden tail structures have been entirely replaced by metal construction in new designs, while almost all new experimental types and new production aircraft have metal wing beams as well.

Engines.—Because of their advantage in weight, reliability, cost, durability, ease of maintenance and performance at altitude, the radial air-cooled engine has continued to be the standard engine in naval aircraft. The Bureau of Aeronautics has kept in touch with all lines of engine development by awarding experimental contracts for liquid-cooled, air-cooled in line, Diesel (radial), and several types of foreign engines but at present the American radial air-cooled seems the best for naval uses. Definite progress has been made in increasing the power of these engines by better cylinder and crank shaft design and by the use of higher compression ratios and intake pressures. The chief requirements of an airship engine are durability and fuel economy. The Maybach engines, which are to be used by the Navy in the U. S. S. *Akron*, possess these requirements to a marked degree. The Bureau of Aeronautics looks to the compression ignition heavy oil engine, however, as the airship engine of the future, and has been concentrating its efforts and experimental funds on its development. Two such experimental engines are now under contract and both are scheduled for delivery during 1932.

U.S.S. *Akron*.—Good progress has been made by the Goodyear-Zeppelin Corporation in the construction of the new airship, the U. S. S. *Akron*. The contractor is working on a schedule which calls for completion of the airship in June, 1931, and it is believed this date can be met. A number of developments have been incorporated in the design as the work proceeded; however, there have been only a few minor changes involving the modification of the contract requirements.

APPLIANCES FOR AIRSHIP OPERATION

Mobile Mooring Mast.—Rigid airship operations throughout the year have shown definite advance toward the solution of the problem of handling large airships. The mobile mooring mast has become a regular part of the handling equipment. Other mechanical appliances, which play necessary roles in a complete mechanical handling system, have been developed and are now in habitual use. Improvements are necessary but an adequate system for handling airships mechanically is definitely visualized and only requires time and effort for its realization.

Landing Decks.—The London Limitation of Armament Treaty allows 135,000 tons in aircraft carriers for Great Britain and the United States, and 81,000 tons for Japan, but prohibits the building of aircraft carriers of 10,000 tons or less unless they are charged to the aircraft carrier tonnage. There is a new provision, however, in the London Treaty, permitting the placing of landing decks on 25 per cent of the total cruiser tonnage. This means that landing decks for aircraft can be placed on about 80,000 tons of cruiser tonnage for the United States and Great Britain and 48,000 for Japan. We now have catapults for launching airplanes on our own present cruisers. But the use of catapults has one great disadvantage, the planes cannot be recovered by the cruiser without stopping and unless the sea is fairly smooth. The placing of a landing deck on a cruiser will permit the recovery of planes at all times because they can take off from the landing deck and return to it regardless of the condition of the sea and without the cruiser having to stop. Landing decks will also permit a much larger number of airplanes to be carried by cruisers. An ordinary cruiser carries from two to four airplanes while a flying deck cruiser will be able to carry from twenty-four to thirty-six planes.

NAVAL EDUCATION

By Carroll Storrs Alden

Head of Department of English and History, U. S. Naval Academy

EXTENSION OF TRAINING

General.—Congress having determined the number of officers and men who shall maintain and man our national ships, it is for the Navy to determine how these officers and men shall be trained so as to give most efficient service. Strength depends partly on numbers, but still more on morale and professional attainment. Since this country has again put itself on record as favoring only very small military establishments, it becomes increasingly necessary that the training shall be kept up to the highest point of perfection. A large part of the Navy are regularly at school. Out of the 84,500 enlisted men appropriated for in 1930, more than one out of twenty has been during a considerable part of the year away from the fleet, under instruction. Of the authorized strength of line officers, 5,499, approximately one out of every eight has been at a special school. And this does not include those taking the aviation courses, who are fully half as many more.

Aeronautical.—The aeronautical branch of the Navy is constantly expanding. In the six years following 1923, officers assigned to this service increased from 456 to 715, and enlisted men from 4,247 to 10,771. How can the numbers that are required be supplied without impairing other activities as a consequence? This is indeed a problem.

Naval Reserves.—Another recent feature has been the improvement and development of the naval reserves. The more the active Navy is reduced, the more imperative is the demand for a highly organized reserve force. Lack of funds has prevented some of the practice at sea desired, but the numbers of those enrolled and receiving some kind of training is encouraging. Their total strength as of June, 1929, was 29,053. Reserve Officers' Training Courses, established in 1926 at Harvard, Yale, and Northwestern Universities, Georgia School of Technology, and the Universities of California and Washington, still continue, and approximately as many students are taking the courses as the law will allow, that is 1,200 in all. In June, 1930, the first to complete the four years' course were graduated, 126 in number, and all but one promptly applied for commissions as ensigns.

PROGRESS IN INSTRUCTION FOR ENLISTED MEN

The enlisted men begin their instruction with nine weeks of recruit training given at the four large stations—Hampton Roads, Va.; Newport, R. I.; Great Lakes, Ill., and San Diego, Calif. All are taught swimming, infantry drill, rowing, personal cleanliness, and care of clothing, so that they may be ready to go on board ship and quickly become a useful part of the crew. During this period they are being studied and classified as to their suitability for future training in the various ratings. For some, almost at once, assignment to special schools will follow. In the education of the enlisted men, more in recent years can be done, for a much larger number of marked intelligence and with more than average schooling are among the applicants. Illiterates have now no chance of acceptance. Of recent recruits fully 56 per cent have completed one or more years in high school. For such men it is by no means an impossible task by study to qualify as electrician's mates, radio operators, machinist's mates, aviation general utility men, blacksmiths, boiler makers, etc. Their instruction occupies from three to nine months. This is the work of the special schools. In addition, the Navy offers to all men afloat or ashore what is similar to correspondence courses. During the past year 46 rating courses and 28 general courses have been offered, and 109,236 copies of instruction pamphlets have been issued. Although study is entirely optional it has been difficult for the Navy to keep up with the demand. Taking advantage of their opportunity, men with no previous experience have become electricians, machinists, radio operators, painters, coppersmiths, etc., gaining what is of great value to them in the Navy, or in civilian life at the close of their enlistment.

COURSES AND PRACTICE FOR OFFICERS

Naval Academy.—In the education of officers the foundation is laid at the Naval Academy. The registration at this institution for the year 1930-31 was 2,057. Every candidate for admission must qualify mentally and physically. The mental requirements for admission are about the same as those set by the colleges, and are what a good high school can meet. They presuppose three years' study of mathematics, as well as of English composition and literature; one year of physics, American history, ancient history, etc. The course at the Naval Academy is four years in length, with the first and third summers occupied by drills at the Academy and the second and fourth by practice cruises at sea on battleships selected from the fleet. The older of the two classes remaining at the Naval Academy is given theoretical and practical instruction in aviation, each midshipman in addition to ground instruction spending several hours in the air and being required to perform almost every duty except handling the controls. In the summer practice cruise of 1930 the squadron visited Cherbourg, Kiel, Oslo, and Edinburgh, and midshipmen were granted several days' liberty in each port. On graduation most midshipmen are commissioned ensigns in the line or staff corps of the Navy, or second lieutenants in the Marine Corps.

Commissioned officers in such numbers as is practicable are detailed to attend special schools, such as those of the submarine at New London, of the torpedo at Newport, and aviation at Pensacola and Lakehurst. Postgraduate instruction is being extended so as to reach more and more of the officers. The first year is spent at the Postgraduate School of the Naval Academy at Annapolis, and the second year (and in some cases also the third year) at one of the universities or at the Naval War College. Instruction is given in such fields as engineering (civil, mechanical, electrical, radio communications, etc.), ordnance, naval construction, and duties of the general line. The Naval War College at Newport gives a senior and junior course. Both are engaged in the "solution of operations problems, involving command, strategy, tactics, and logistics; historical studies. . . ; the study and solution of international law situations with discussions of decisions. . ." The War College also conducts four correspondence courses, in strategy, tactics, and international law.

COGNATE SOCIETIES

SERVICE SOCIETIES

American Legion, 777 N. Meridian Street, Indianapolis, Ind.

American Remount Assn., 810 18th Street N. W., Washington, D. C.

American Signal Corps Assn., 195

Broadway, New York City.

ARMY AND NAVY UNION, U.S.A., 315 Hazen Bldg., Cincinnati, O.

ASSN. OF MILITARY SURGEONS OF THE UNITED STATES, Army Medical Museum, Washington, D. C.

CHEMICAL WELFARE SERVICE, Edgewood Arsenal, Maryland.

MILITARY TRAINING CAMP ASSN., 19 W. 44th Street, New York City.

NATIONAL GUARD ASSN. OF THE UNITED STATES, 32nd Street and Lancaster Ave., Philadelphia, Pa.

NAVY LEAGUE OF THE UNITED STATES, 1749 E Street N. W., Washington, D. C.

PENNSYLVANIA NATIONAL GUARD, 32nd Street and Lancaster Avenue, Philadelphia, Pa.

QUARTERMASTERS' ASSN. OF THE UNITED STATES, 923 15th Street, N. W., Washington, D. C.

RESERVE OFFICERS ASSN. OF THE UNITED STATES, 1653 Pennsylvania Ave., N. W., Washington, D. C.

SOCIETY OF AMERICAN MILITARY ENGINEERS, 810 Mills Bldg., Washington, D. C.

SOCIETY OF NAVAL ARCHITECTS & MARINE ENGINEERS, 29 W. 39th Street, New York City.

U. S. ARMY ORDNANCE ASSN., 806 Mills Bldg., Washington, D. C.

U. S. CAVALRY ASSN., 1624 H. Street N. W., Washington, D. C.

U. S. FIELD ARTILLERY ASSN., 1624 H Street N. W., Washington, D. C.

U. S. INFANTRY ASSN., 1115 17th Street N. W., Washington, D. C.

UNITED STATES NAVAL INSTITUTE, Annapolis, Md.

PATRIOTIC AND HEREDITARY

COLONIAL DAMES OF AMERICA, 421 E. 61st Street, New York City.

DAUGHTERS OF 1812 U. S. NATIONAL SOCIETY, 108 Iona Ave., Narberth, Pa.

DAUGHTERS OF THE AMERICAN REVOLUTION, Memorial Continental Hall, Washington, D. C.

DAUGHTERS OF THE REVOLUTION NATIONAL SOCIETY, 420 Lexington Ave., New York City.

GRAND ARMY OF THE REPUBLIC, Room 3, City Hall, New York City.

MILITARY ORDER OF FOREIGN WARS OF THE U. S., 149 Broadway, New York City.

MILITARY ORDER OF THE LOYAL LEGION, 140 Nassau Street, New York City.

MILITARY ORDER OF THE WORLD WAR, 52 Vanderbilt Ave., New York City.

NATIONAL SECURITY LEAGUE, 45 West 45th Street, New York City.

NATIONAL SOCIETY OF THE SONS OF THE AMERICAN REVOLUTION, 1227 16th St. N. W., Washington, D. C.

NATIONAL SOCIETY OF THE SONS OF THE REVOLUTION, Princeton University, Princeton, N. J.

ORDER OF FOUNDERS AND PATRIOTS OF AMERICA, 111 Broadway, New York City.

PILGRIM SOCIETY, Pilgrim Hall, Court Street, Plymouth, Mass.

SOCIETY OF THE CINCINNATI, 136 W. Lanvale Street, Baltimore, Md.

SOCIETY OF COLONIAL WARS, 124 E. 58th Street, New York City.

SOCIETY OF MAYFLOWER DESCENDANTS, 120 E. 71st Street, New York City.

SONS OF THE AMERICAN REVOLUTION, NATIONAL SOCIETY, 1227 16th St. N. W., Washington, D. C.

SONS OF CONFEDERATE VETERANS, Law Bldg., Richmond, Va.

SONS OF VETERANS, Reading, Pa.

SPANISH-AMERICAN WAR, NAVY AND MILITARY ORDER, 184 State House, Boston, Mass.

UNITED CONFEDERATE VETERANS, New Orleans, La.

PART FOUR
ECONOMICS AND BUSINESS

DIVISION X
BUSINESS AND FINANCE

ECONOMIC AND BUSINESS CONDITIONS

By S. S. Huebner
Wharton School of Finance & Commerce, University of Pennsylvania

THE GENERAL DEPRESSION

Steady Decline in Business.—As fittingly described by the Guaranty Trust Company of New York in its recent survey (*The Guaranty Survey*, December 29, 1930), "the record of the business year in the United States is one of almost uninterrupted recession in industrial output, trade volume, employment, and commodity prices." Following the slump in industrial operations during the closing weeks of 1929, resulting from the collapse of stock market prices in October and November, there occurred a temporary revival. But this recovery spent its force within a few weeks and thereafter, as summarized in the aforementioned review, "during the remainder of the year, there has been no break in the downward movement of business activity and prices, except where individual industries responded for a time to the seasonal conditions that promote expansion in the autumn."

Barometric Indicators.—A review of the various barometers of business clearly indicates an unusually low level of business activity during all of the year. Check transactions during the first nine months of 1930 fell below those of the same months in 1929 by nearly 25 per cent. As compared with 1929, the volume of stock market transactions during 1930 was also smaller by over 28 per cent. Railroad shares (using the Babson average) declined to an average of 124.06 in October, as compared with the high average of 189.11 for the corresponding month in 1929. Industrial shares also reached the low average level of 214.18 in October, as contrasted with 381.17 for the month of September, 1929. Copper shares sank to the extraordinary low level of 28.2 during October, as compared with the corresponding average of 80.7 during September, 1929. Moreover, as a further reflection of business stagnation, money rates for demand loans reached a monthly average during September as low as 21.4 per cent, and for time loans of 3 per cent, as compared with the corresponding averages in 1929 of 8½ per cent and 6⅛ per cent.

Agriculture.—Most of the indices of trade will be referred to under the headings of "Resumé of Leading Indices of Trade," and "Index Numbers." But passing reference should also be made to business conditions prevailing in the leading groups of industries not chronicled in the commonly used indices of trade. According to *The Guaranty Survey*, agriculture "was faced during 1930 with unfavorable weather, poor crops, and unsatisfactory markets. Total crop output was 6 per cent below that of last year, and 5 per cent below the average for the ten years preceding. . . . Despite the reduction in the yields of the several crops, the surplus production problem remained with this industry. Not only did domestic demand increase, but foreign shipments of agricultural commodities were the lowest since 1915. . . . The reduced yields of most crops and the lower prices for agricultural commodities greatly reduced the farmers' income. The Secretary of Agriculture places the gross income from farm products during 1930 at $9,950,000,000, which marks a decrease of 16 per cent below that during 1929. This lower income, combined with the fact that the disparity between the price level at which farmers buy and the one at which they sell was the widest since 1921, marks the year 1930 a most unsatisfactory one for the farmer."

The Railroads.—With respect to the railroads, another of the nation's most pivotal industries, the same survey reviews the year's situation as follows: "The rate of return for the first ten months of 1930 was 3.51 per cent which compares with 5.19 per cent in the corresponding period last year. . . . Railway freight loadings during 1930 up to Dec. 13 totalled 44,635,184 cars, as against 51,345,761 cars a year ago, and 50,021,293 cars two years ago."

Other Industry.—For other leading types of industries the National City Bank of New York gives the following summary in its December issue of *Economic Conditions*: "For the month of October industrial consumption of electrical power, as reported by the *Electrical World*, was off 23 per cent from that of October a year ago, railway car loadings were off 19 per cent, factory employment and payrolls 20 and 29 per cent respectively, building contracts 24 per cent, steel production 40 per cent, and automobile output 60 per cent. During November there was a further shrinkage in steel mill operations from 47 to 40 per cent of capacity, and average daily building contract awards for the first three weeks of the month totalled 23 per cent under the daily average of November last year."

EFFECTS OF THE DEPRESSION

Losses in Operation.—In nearly all other outstanding lines of business a very substantial loss in operations is also apparent during the first three-quarters of the year as compared with 1929. Using the latest available production figures in ten leading industries (Babson reports) the showing is as follows: automobiles and trucks (September, 1930), only 222,931 as compared with 415,912 for September, 1929; gasoline (bbls., August), 37,844,000 as compared with 38,510,000 in 1929; pneumatic tires (July), only 3,193,000 as compared with 4,856,000 in 1929; copper (lbs., September), only 113,168,000 as compared with 158,804,000 in 1929; steel ingots (tons, September), only 2,867,978 as compared with 4,510,879 in 1929; bituminous coal (tons, September), 38,632,000 as compared with 44,515,000 in 1929; lumber (northern hardwoods, bd. ft., August), only 9,225,000 as compared with 22,459,000 in 1929; cement (bbls., September), 16,124,000 as compared with 17,223,000 in 1929; boots and shoes (no. pairs, August), only 27,842,231 as compared with 36,444,971 in 1929; and cotton consumption (bales, September), only 394,321 as compared with 545,649 in 1929. In practically all cases, judging from subsequent newspaper accounts and other surveys, the course of production has shown no improvement; instead the general tendency has been towards further recession during October and November.

Decline in Corporate Profits.—The effect of such a wide recession in business operations upon industrial earnings has been most marked, and accounts largely for the extraordinary decline in the price of common corporate shares. In its November (1930) report on "Business Profits," the National City Bank indicates in the following table the change in net profits of 200 industrial corporations in the third quarter of 1929 and 1930, with their percentage change during this quarter and the nine months' period:

NET PROFITS OF 200 INDUSTRIAL CORPORATIONS IN THIRD QUARTER OF 1930

With Percentage Change During Quarter and Nine Months
(In Thousands of Dollars)

		Third Quarter		Per Cent	Change
		1929	1930	Quarter	9 Mos.
11	Automobiles	$ 84,990	$ 36,003	—57.6	—44.3
19	Auto Accessories	10,486	2,867	—72.7	—47.8
14	Chemicals and Drugs	41,945	29,700	—29.2	—16.4
6	Electrical Equipment	25,605	17,331	—32.3	—20.3
21	Food Products	41,337	33,373	—19.3	—15.2
18	Iron and Steel	86,165	33,088	—61.6	—40.9
16	Machinery	8,755	3,974	—54.6	—27.4
4	Office Equipment	5,435	3,044	—44.0	—33.0
13	Petroleum	38,607	16,602	—57.0	—41.8
6	Printing and Publishing	7,361	5,526	—24.9	— 5.6
5	Tobacco (Cigars)	2,613	1,759	—32.7	—24.3
67	Miscellaneous	49,813	34,660	—30.4	—27.3
200		$403,112	$217,927	—45.9	—33.3

Decrease in Construction.—In the field of building construction conditions were also unsatisfactory. Last year's account called attention to the decline in this important field (namely $5,016,291,000 in 1929, as compared with $5,842,851,200 in 1928) owing to the fact that the new building supply had outstripped the demand. This year, however (for the first nine months of 1930 for which records are available), indicates another substantial decrease as compared with the corresponding months of 1929. As regards new buildings started in September, 1930 (Babson's summary of the F. W. Dodge Corporation reports, representing three-quarters of the nation's population), the total is only $297,447,000 as compared with $397,335,600 for the same month in 1929. For the first nine months of the year the total is only $3,174,494,000 as contrasted with $3,982,790,500 for the corresponding period of 1929.

RESUMÉ OF LEADING INDICES OF TRADE

Capital Financing.—A brief resumé of the leading indices of trade for the major part of 1930, aside from the financial and security market indices already referred to in another section of this volume, will also serve to show that, with few exceptions, business conditions during the first nine months of 1930 were far below normal. New capital financing for the first nine months of the year totals only $4,474,761,601 as compared with $7,455,561,454 for the corresponding period of 1929.

Foreign Trade.—Exports of merchandise during the first nine months of the present year were only $2,958,509,000, as compared with $3,843,676,000 during the same period of 1929, a decrease of approximately 23 per cent. In the case of imports of merchandise there was also a severe slump, the nine months' total standing at only $2,401,838,000 as compared with $3,360,017,000 for the same period of 1929, or a decrease of over 28 per cent.

Pig iron production for 1930 (nine months) totals only 25,702,000 tons as compared with 32,678,000 for 1929, or a decline of over 21 per cent.

Railroad Earnings.—Gross railway earnings also registered a severe decline for the first eight months (latest figures available), *i. e.*, gross earnings were $14,959 per mile in 1930 as against $17,369 in 1929, and net earnings $3,848 as against $5,070 for the preceding year.

Business Failures.—As compared with 1929, the first nine months of 1930 show a considerable increase in the number of bankruptcies, namely, 18,779 as contrasted with 16,030. But the liabalities involved in such failures show an even greater increase; namely, $571,423,389 as compared with $401,049,520 for the corresponding nine months of 1929.

Dividend Payments.—In only one important respect is the showing still highly satisfactory; namely, in dividend distributions. Industrial dividend payments (Babson's reports) are reported for the first ten months of the year at $2,456,410,000 as compared with $2,151,000,000 for the same period in 1929. Railroad and traction dividends for the first ten months of 1930 (Babson's reports) are placed at $518,500,000 as compared with $485,300,000 for the same period in 1929. This remarkable showing is traceable to the very satisfactory surplus accounts accumulated by the nation's leading corporations during the prosperous years of 1925-29. Yet it should be stated that the severe decline in the stock market has probably discounted a material revision in this apparently satisfactory condition.

CORPORATE FINANCING

(Babson's Reports)

	1929		1930	
	Capital	Refunding	Capital	Refunding
January	$ 828,326,946	$142,547,192	$629,082,554	$73,096,000
February	853,184,200	122,393,350	468,573,502	27,635,500
March	882,453,445	58,327,000	630,889,863	15,436,500
April	536,657,163	134,171,779	628,444,371	51,258,750
May	923,045,666	390,847,640	864,042,218	63,334,000
June	613,879,625	16,222,217	445,363,199	67,315,250
July	803,553,355	59,294,141	402,280,500	27,481,000
August	763,177,040	25,045,000	121,515,774	68,350,000
September	1,201,284,014	306,592,000	284,569,620	62,317,000
October	724,166,097	33,088,000		
November	186,793,059	15,338,250		
December	261,891,476	83,055,000		

YEARLY TOTALS OF CORPORATE FINANCING

	Capital	*Refunding*
1930	$4,474,761,601*	$ 456,224,000*
1920	8,628,412,086	1,386,921,569
1928	6,014,765,666	1,738,274,615
1927	5,373,229,066	1,928,187,260
1926	4,357,002,720	942,550,970
1925	4,100,725,167	637,384,524
1924	3,322,295,764	516,275,300
1923	2,712,996,155	530,343,942

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* For nine months.

INDEX NUMBERS

Last year's discussion called attention to the declining tendency in commodity prices, and the causes therefor. This year's tendency is similar, if we may judge from Bradstreet's *Index of Wholesale Prices.* But in contrast to last year, the downward tendency has been much more rapid. For 1930 this Index Number averaged only 10.7454 as compared with 12.6685 for 1929, or a decrease of 15.2 per cent. The present year's Index Number of 10.7454 should be compared with 18.6642 for 1919, showing a decline of nearly 42.4 per cent.

The same tendency is also to be noted with respect to outstanding wholesale commodities. Thus on the basis of Babson's Index Number of commodities of hides and leather, print cloth, petroleum, iron and steel, rubber, paper, wool, building materials, non-ferrous metals, and bituminous coal, the average price level for 1930 (first nine months) stood at 132, as compared with the corresponding average of 150 for 1929, 156 for 1928, 157 for 1927, and 175 for 1926.

As regards the price and volume of labor there is also a decided decline as compared with 1929, as far as the first three-quarters of the year are concerned. For September of 1930 the report of the New York State Department of Labor for manufacturing establishments in New York State places employment conditions at 85 and payroll conditions at 85, whereas for the corresponding month of 1929 these figures stood respectively at 100 and 106. Averaged for the first nine months, the 1930 figures stand at 88 and 89, as contrasted with 98 and 102 for the corresponding period of 1929.

INDEX NUMBERS
(Babson's Reports)

	U. S. Dept. of Labor		Babson		U. K. Board of Trade	
	1929	1930	1929	1930	1929	1930
January	97.2	93.4	155	141	83.2	78.8
February	96.7	92.1	150	138	83.2	76.9
March	97.5	90.8	152	136	84.4	74.9
April	96.8	90.7	149	136	83.4	74.4
May	95.8	89.1	149	134	81.7	73.3
June	96.4	86.8	150	133	81.6	72.6
July	98.0	84.0	148	133	82.7	71.7
August	97.7	84.0	150	132	81.8	70.8
September	97.5	84.2	150	132	81.7	69.5
October	96.3		149		81.9	
November	94.4		147		80.6	
December	94.2		145		79.7	

YEARLY PRICE AVERAGE

	Bradstreet		*Bradstreet*
1902	7.88	1917	15.6385
1903	7.94	1918	18.7117
1904	7.92	1919	18.6642
1905	8.09	1920	18.8096
1906	8.41	1921	11.3695
1907	8.90	1922	12.1186
1908	8.00	1923	13.4028
1909	8.51	1924	12.8672
1910	8.98	1925	13.9445
1911	8.7129	1926	13.0207
1912	9.1867	1927	12.7788
1913	9.2115	1928	13.2824
1914	8.9985	1929	12.6685
1915	9.8531	1930	10.7450
1016	11.8236		

THE SECURITY AND MONEY MARKETS

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ANALYSIS OF PRICE MOVEMENT

During most of 1930, and especially following April, the course of the stock market was most disappointing to security owners. Although dividend cuts or omissions have as yet been comparatively few, present market prices for innumerable issues seem to have discounted substantial dividend revisions. Whereas price levels for all leading groups of stocks reached unbelievably high proportions in the bull market of 1929, extraordinarily low levels were reached during the bear market of 1930.

Last year's account explained the nation-wide stampede to unload securities during the panic weeks of October and November, with the result that all stock markets experienced a collapse of unprecedented proportions. That collapse, as was explained, reached the proportions of a gigantic panic, which for abruptness and extent was probably the greatest in our stock market history. The volume of transactions accordingly exceeded all previous records, while the depression in quoted values on the New York Stock Exchange alone during October and the first two weeks of November reached the stupendous amount of about $23,000,000,000.

So extraordinary was the decline that many regarded the average price level of Nov. 13 as marking the bottom of the movement. Considerable color was lent to this view by the substantial upward reaction which occurred in prices following the financial smash of November, 1929, a rise which continued almost uninterruptedly until April, 1930. In that month, however, the market again headed downward, and continued to decline until late in June. The average low, however, was well above the low of Nov. 13 and was followed by a rise throughout July. Now more than ever the viewpoint seemed to prevail that the low of the panic of 1929 was not to be broken. All summer the market seemed to move more or less uncertainly. In September, however, a distinct declining tendency began, greatly increasing in momentum, and reaching a new low in November, as compared with November of 1929, and subsequently another new low in December. At present the average price level is but slightly above the lowest point reached during the year. The loss in quoted values has again been staggering. According to latest press accounts, the value of all listed stocks on the New York Exchange dropped $11,400,000,000 from Jan. 1 to Dec. 1 of this year. But from the high point of the year in April to Dec. 1 the loss is placed at $22,770,000,000. It is also reported that the decline from the high of the bull market of 1929 to Dec. 1, 1930, aggregated $36,360,000,000. But all these reported figures extend only to Dec. 1, and do not take into account the very substantial decline which occurred during the last month of this year. To really grasp the situation, it is also essential to bear in mind that the aforementioned figures pertain only to stocks listed on the New York Exchange, whereas similar drastic liquidation also occurred on the Curb Exchange and all other security markets of the country.

TRANSACTIONS AND PRICES

Volume.—Although not nearly so large as in the phenomenal year of 1929, the 1930 volume of stock market transactions was nevertheless exceedingly large. Shares sold on the New York Stock Exchange totalled 810,598,298, according to latest newspaper accounts, as compared with 1,124,991,490 for 1929, 919,661,825 for 1928, 576,563,218 for 1927, 450,845,255 for 1926, and 317,000,000 for 1919 (the highest record of preceding industrial cycle). Similarly, on the New York Curb Market 1930 stock sales totalled 222,268,045 shares as compared with 473,770,970 shares during 1929, and 230,043,682 shares during 1928. Although smaller than the years 1929 and 1928, the 1930 New York Stock Exchange total exceeds that of 1927 (the highest record up to that time) by over 40 per cent.

Railroad Shares.—In explaining the movement of stock prices, Babson's composite price for different groups of selected stocks may be used for illustrative purposes. Thus using his list of twenty representative railroad stocks, the September, 1930 average high price stood at 132.73, as compared with 189.11 for the corresponding month of 1929. For all of the first nine months of 1930 the average was 145.45, as compared with 167.03 for the corresponding nine months of 1929, 142.65 for the same months in 1928, 135.30 for 1927, 114.53 for 1926, 100.60 for 1925, and 74.34 for 1921. During 1929 railroad shares reached the highest monthly level during September, namely 189.11. For October (through October 26) the average monthly high has been placed in the Babson figure at 124.06, this average representing a decline of over 34 per cent, as compared with September, 1929. Since October, however, there has been a considerable further decline but the compiled average is not yet available.

Industrial Shares.—In industrial stocks the decline in prices was even greater, and this is significant because of the unusual decline undergone by this group of shares during the panic of 1929. Again taking Babson's composite prices for thirty leading representative industrial stocks for illustrative purposes, it appears that the September average high price for 1930 stood at 245.09, as compared with 381.17 for the corresponding month of 1929. For the first nine months of 1930 the average high is 266.17 as compared with 338.90 for the corresponding nine months in 1929, 219.41 for the same months in

1928, 173.87 in 1927, 156.67 in 1926, and 75.09 in 1921. The first nine months' average of 1930 shows a decrease of over 35 per cent as compared with the corresponding average of 1929.

Copper Shares.—A similar situation, and even more violent in extent, presents itself in the copper group. Although a large decline in the price level for this group occurred during the later months of 1929, a much greater decline took place during 1930. According to Babson's composite price for twenty leading and representative copper stocks, the average high price for September, 1930 stood at only 28.2 as compared with 80.7 for the corresponding average in 1929, or a decline of 65 per cent. For the first nine months of 1930, the average high is only 40.6 as compared with 80.1 for the corresponding period in 1929, 48.3 in 1928, 32.7 in 1927, 29.4 in 1926, and 25.5 in 1921. The first nine months' average in 1930 shows a decrease of 50 per cent over the similar period of 1929. However, folllowing September the market has undergone two additional declines, namely in November and December. The Babson average for December, 1930 was not available at the time of writing, but it is clear that the average price level of September has been carried materially lower.

Price Factors.—Much of the seriousness of the aforementioned decline is attributable to the same basic factors which caused the drastic market liquidation of October and November of 1929. These were discussed fully in last year's issue of THE AMERICAN YEAR BOOK, and need not be repeated. Suffice it to say that the market decline is largely the result of the accumulated mass of speculative error committed along many lines—in real estate, manufacturing, commodity markets, security purchases, etc., during the boom period of 1928 and 1929.

EXPLANATION OF LOW PRICE LEVELS

After the first violent stock market decline at the end of 1929, it was inevitable that a serious business recession would occur. That recession has continued through 1930, and business may now be said to be at the lowest point reached during the year. In fact, the industrial depression has reached such proportions as to give every appearance of an all-around readjustment, not only in share values, real estate, and wholesale prices, but also including rent, retail prices, and possibly wages. Moreover, the depression is not confined to any one country, but seems to be world-wide. The reasons for the long continued low level of stock prices are not far to seek. With business as a whole approximately 25 percent below normal in the United States, and with an enormous number of unemployed, there has resulted an unusual absence of buying power which is being reflected in all markets, both security and commodity. Practically all of the nation's standard commodities have also experienced an enormous decline, as explained in the section on "Economics and Business Conditions," and this has resulted in further losses to owners, and consequently a lack of power to undertake speculative commitments in the stock market. Moreover, there has been an enormous drop in real estate values, as well as in other forms of non-liquid assets, thus tying up financially many individuals and financial institutions. In ever so many instances obligations in these directions must be met by sales of shares owned through the medium of the stock market. It may be said, in fact, that during all of the last half of 1930 the continuous stock market has been compelled to be the shock absorber for all the non-liquid enterprises of the country. Being the only places which afford a ready market, our stock exchanges are resorted to as the place of sale for the only assets which seem to have a ready market in such a serious period of business depression. In other words there has been a great deal of forced liquidation; hence the steady, although surprisingly gradual, liquidation to lower and lower price levels in the stock market during the later months of the year.

THE BOND MARKET

Sales Volume.—Bond sales on the New York Stock Exchange during 1930, according to latest newspaper accounts, totalled $2,820,585,000, as compared with $3,020,300,000 for 1929, and with $2,939,700,000 for the full year of 1928. In other words the volume of sales during 1930 is approximately the same as it was in the two preceding years.

Price Movement.—The 1930 price level for investment bonds, judging from Babson's composite price of twenty leading and representative bonds, is somewhat above that of the year before, and slightly under that of 1928. The September, 1930, average stood at 98.5 as compared with the corresponding average of 90.9 for 1929, or an increase of nearly 8.3 per cent. As compared with the corresponding average of 1928 (95.0) the increase is approximately 3.5 per cent. For the first nine months of 1930, the average stood at 95.8 as compared with the corresponding average for 1929 of 92.3, 96.7 for 1928, 95.8 for 1927, 92.6 for 1926, 89.8 for 1925, 86.9 for 1924, 84.4 for 1923, 87.0 for 1922, 75.5 for 1921, and 73.4 for 1920.

Market Conditions and Factors.—The bond market has proved most disappointing throughout the year. As was explained last year, bonds have a tendency to rise if interest rates and commodity prices fall, and to decline if interest rates and commodity prices rise. This year, however, with cheap money rates and lower commodity prices prevailing throughout the year, sound investment bonds have shown little disposition to rise materially. This strange phenomenon of good bonds refusing to respond to the stimulating influence of easy money and of declining commodity prices has been the subject of much comment. The answer again seems to be that the bond market has been compelled to absorb a lot of forced liquidation. On the one hand, financial institutions have in many instances been obliged to sell bonds to strengthen their cash position. Similarly, many life insurance companies, whose loans to policyholders have reached unusually large proportions, have also been obliged to dispose of a portion of their bonds. As regards individuals, many have been obliged to protect their non-liquid obligations with the sale of bonds, whereas in other instances, owing to the enormous decline in stock prices, the speculatively inclined have seen fit to shift from bonds to shares. While the aforementioned statements pertain to high grade investment bonds, mention should also be made of the fact that 1930 witnessed a rather severe decline in second grade bonds.

SECURITY MARKET PRICES

(Babson's Statistical Service)

	20 Rep. R. R. Stocks		30 Rep. Ind. Stocks		20 Rep. Copper Stocks		20 Rep. Bonds Stocks	
	1929 high	1930 high	1929 high	1930 high	1929 average	1930 average	1929 average	1930 average
Jan. ...	158.54	148.86	317.51	267.14	76.7	50.6	94.0	94.4
Feb. ...	161.32	156.26	322.06	272.27	83.0	51.3	93.4	94.2
Mar. ...	158.62	157.94	321.18	286.19	88.0	50.8	92.5	95.5
Apr. ...	152.16	157.02	319.29	294.07	82.5	45.9	92.6	95.1
May ...	153.95	145.31	327.08	275.07	77.0	39.3	92.5	95.2
June ...	161.68	143.73	333.79	274.45	75.3	35.0	91.9	95.7
July	179.13	135.46	347.70	240.81	77.1	32.9	91.7	96.5
Aug. ...	188.76	132.06	380.33	240.42	80.5	31.2	91.3	97.5
Sept. ...	189.11	132.73	381.17	245.09	80.7	28.2	90.9	98.5
Oct. ...	178.53	124.06*	352.86	214.18*	66.2		92.3	
Nov. ...	156.22		257.68		53.7		93.1	
Dec. ...	151.95		263.46		51.1		95.6	

* To October 26 only.

SHARES TRADED ON THE NEW YORK STOCK EXCHANGE

	1929	1930
January	110,805,940	62,308,290
February	77,968,730	67,834,100
March	105,661,570	96,552,040
April	82,600,470	111,041,000
May	91,283,550	78,340,030
June	69,546,040	76,593,250
July	93,378,690	47,746,090
August	95,704,890	39,869,500
September	100,056,120	53,545,145
October	141,668,410	
November	72,455,420	
December	83,861,660	

YEARLY TOTALS

	Shares of Stock
1919	316,787,725
1920	226,640,400
1921	172,712,716
1922	258,652,519
1923	236,115,040
1924	281,991,597
1925	461,404,733
1926	450,845,255
1927	576,563,218
1928	919,661,825
1929	1,124,991,490
1930	633,829,445**

** Total for first 9 months only.

MONEY RATES
(Babson's Statistical Service)

	Average Time and Call Rates in New York City 1929		1930		Average Bank Rates—England, France and Germany		Gold Movements * Exports exceed Imports	
	Dom.	Call	Dom.	Call	1929	1930	1929	1930
January	5½	7½	4⅞	4¾	4⅞	5⅛	$47,199,000	$ 3,950,000
February	5½	6¾	4⅚	4¼	5⅛	4½	25,488,000	59,991,000
March	5⅝	8⅞	4⅛	3¾	5⅙	4⅛	24,835,000	55,478,000
April	7⅞	8⅜	3⅞	3⅞	5⅙	3⅞	23,093,000	65,725,000
May	6	9	3¾	3	5½	3⅜	23,631,000	23,470,000
June	6	7⅝	3⅜	2½	5½	3¼	30,212,000	13,912,000
July	6	9⅛	3⅛	2¼	5½	3⅙	34,718,000	19,640,000*
August	6⅛	8¼	3	2⅛	5½	3⅙	18,390,000	19,618,000*
September	6⅛	8½	3	2¼	5½	3⅙	17,576,000	2,536,000
October	6⅛	6½			5⅙		17,516,000	
November	5⅝	5⅜			5½		23,166,000*	
December	5	4¾			5¼		64,426,000*	

THE MONEY MARKET

In strong contrast to 1929, money rates (both time and call) have remained relatively low throughout 1930. Starting with a January average of 4⅞ per cent for commercial paper rates and 4¾ per cent for call loans, the average monthly rates gradually declined month by month, until for September they stood respectively at 3 and 2¼ per cent. For many days, however, call loan rates have been quoted at 2 per cent or less. Such figures seem a strange contrast to the average monthly rate of 9⅛ per cent for call loans during May and June of 1929 in the midst of the unprecedented bull stock market of that year.

During the first nine months of 1930 both time and call rates, as already stated, showed a gradually declining tendency. The January averages (Babson's figures) stood at 4⅞ and 4¾ per cent, as compared with 5½ and 7½ per cent for the corresponding month of 1929. By March the averages were 4⅛ and 3¾ per cent, as compared with 5⅝ and 8⅞ for the corresponding month of 1929, and for April 3⅞ and 3⅞ per cent as compared with 5⅞ and 8⅜ per cent in 1929. Thereafter the monthly commercial paper rate never averaged higher than 3¾ per cent, and reached 3 per cent in September. New York demand loan rates also remained low, the monthly averages being 3 per cent for May, 2½ per cent for June, 2⅛ per cent for August, and 2½ per cent for September. For the first nine months of 1930 the average commercial paper rate (Babson's figures) was 3¾ per cent as compared with 5⅞ per cent for the corresponding months of 1929, while demand loans in New York averaged 3¼ per cent for the first nine months of the year as compared with 8¼ per cent for the corresponding period of 1929.

VOLUME OF BANKING TRANSACTIONS

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TOTAL CHECK TRANSACTIONS

Check transactions, since the published data is sufficiently frequent as well as complete for the entire nation, represent an excellent barometer of national business conditions. Whereas these transactions indicated a condition of great business prosperity during 1929, they reflected an unusual degree of business adversity during 1930. For the first nine months of 1930 (using the figures of Babson's *Reports on Fundamental Conditions*) check transactions amounted to only $544,429,624,000, as compared with $725,845,381,000 for the corresponding period of 1929, or a decline of nearly 25 per cent. For the first nine months the 1930 total of $540,000,000,000 compares with corresponding totals of $611,000,000,000 for 1928, $522,000,000,000 for 1927, $481,000,000,000 for 1926, and $298,000,000,000 for 1921. Whereas the 1929 figure exceeded that of the corresponding period of 1928 by nearly 19 per cent, it is significant that this year's total, although 25 per cent under the 1929 total, is also smaller than the 1928 total by 10.9 per cent. As compared with the last depression year; namely, 1921, the total for the first nine months of 1930 is larger by 83 per cent. But allowance must be made for three important factors,—the normal increase in the nation's business development, the increased use of clearing facilities, and to some extent the much greater speculative activity on the nation's leading stock exchanges.

CHECK TRANSACTIONS IN NEW YORK CITY

As explained in previous issues of The American Year Book, New York City constitutes the nation's center of speculative activity in the security market, and 1930 transactions in the New York stock market reached the high figure of 810,555,818 shares. This figure falls short of the unprecedented total of 1,125,068,620 shares for 1929, and is also considerably smaller than the next highest total,—920,633,396 shares in 1928. Yet with the exception of these two boom stock market years, the total of 1930 is the largest on record. It is, therefore, important to note the volume of check transactions for New York, in contrast to the figures for the rest of the country. For the first nine months of the present year New York check transactions totalled $302,404,723,000, or $60,399,762,000 (nearly 25 per cent) in excess of the total for the rest of the country. As compared with 1929, New York City check transactions for 1930 (first nine months) decreased by $145,000,000,000, while the decrease for the rest of the country, exclusive of New York, was only $36,000,000,000. This disproportionate decrease in New York, as compared with the rest of the country, reflects in large part the substantial decline from the unprecedented 1929 transactions in the New York stock market, *i. e.*, from 1,125,000,000 shares in 1929 to 810,000,000 shares in 1930.

TRANSACTIONS OUTSIDE NEW YORK CITY

The foregoing figures indicate the importance of considering separately the check transactions of the country after New York City is excluded. Exclusive of New York City, the 1930 nine months' total of the nation stands at only $242,024,961,000 as compared with $278,477,482,000 for the corresponding period of 1929, or a decrease of nearly 14 per cent. The figure for 1930, therefore, exclusive of New York City, again indicates strongly the extent of the year's business depression. But attention must again be called to the necessity of making allowance for the normal growth in the nation's volume of business as well as the normal increase in the use of checking facilities. If such allowance is made, the extent of the business decline during 1930, exclusive of stock market activity, is really greater than that indicated by the aforementioned decline of 14 per cent.

CHECK TRANSACTIONS

(*Babson's Reports*)
(000 excluded)

	Exclusive of New York		Inclusive of New York	
	1929	1930	1929	1930
January	$31,079,466	$29,598,775	$86,857,593	$64,330,280
February	27,922,414	24,666,260	74,211,164	55,783,089
March	32,000,004	28,572,518	87,424,982	69,312,399
April	30,734,727	27,942,315	78,713,687	66,573,532
May	30,331,905	27,934,166	80,375,062	65,356,958
June	30,361,310	28,266,461	73,624,015	65,956,816
July	32,517,798	26,634,477	81,732,978	56,271,588
August	32,173,939	23,995,904	81,207,501	49,047,834
September	31,355,919	24,414,085	81,698,219	51,797,188
October	36,827,926		100,153,216	
November	32,512,968		86,116,677	
December	30,913,128		70,763,593	

BANK CLEARINGS BY FEDERAL RESERVE DISTRICTS

December figures (as published by the *Commercial and Financial Chronicle*) indicate but slight improvement during the last month of the year. For the week ending December 20, clearings for the various Federal Reserve districts shows the following increases or decreases as compared for the corresponding week of 1929: Boston district (12 cities) 5.4 per cent; New York (11 cities), 6.3 per cent; Philadelphia (10 cities), 38.4 per cent; Cleveland (8 cities), 1.7 per cent; Richmond (6 cities), 10.8 per cent; Atlanta (12 cities), 22.3 per cent; Chicago (20 cities), 22.4 per cent; St. Louis (8 cities), 19.7 per cent; Minneapolis (7 cities), 15.3 per cent: Kansas City (12 cities), 17.0 per cent; Dallas (5 cities), 35.6 per cent; San Francisco (16 cities), 10.7 per cent. For the 126 cities represented in the aforementioned tabulation, inclusive of New York City, the decline is 9.9 per cent, as compared with the corresponding week of last year. With New York excluded, the decline is 12.2 per cent. The predominant importance of New York should also be noted, that city's total of $7,078,302,412 for the week comparing with $3,648,294,828 for all of the balance of the cities.

YEARLY TOTALS

	Exclusive of New York	Inclusive of New York
1930	$242,024,961*	$544,429,684*
1929	378,731,504	982,878,867
1928	348,807,402	850,200,685
1927	323,164,467	714,722,361
1926	309,363,401	648,418,649
1925	292,394,131	605,760,384
1924	260,310,695	523,957,472
1923	256,556,999	495,097,836
1922	222,152,058	463,987,457
1921	199,087,442	405,976,001
1920	242,069,771	484,500,290
1919	210,547,763	457,970,614

* Total for first nine months only.

FOREIGN TRADE

BY ROLAND L. KRAMER

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VALUE AND VOLUME

Aggregate Decline.—Foreign trade in the fiscal year ended June 30, 1930, amounted to $8,543,000,000, representing a decline of 11.6 per cent from the high level of the preceding year. In both exports and imports, volume was maintained during the first half of the fiscal year, at substantially the same amount as during the first half of 1928-29. Beginning in December, 1929, and January, 1930, the value of both exports and imports registered marked recessions. This decline in the value of the foreign trade persisted throughout the calendar year, 1930. The latest figures available indicate a decline of 27 per cent in the foreign trade for the ten months ended October, 1930, as compared with the same period of time in 1929.

Export and Import Decline.—In exports, this ten-month decline reached 25 per cent and in the import trade it amounted to 29 per cent. In many important commodity lines, lowered prices as well as smaller volume contributed to the decreased value of trade.

EXPORTS, IMPORTS AND BALANCE OF TRADE

(in millions of dollars)

	Exports	*Imports*	*Balance of Trade*
1910-14 average..	2,166	1,689	477
1928-29	5,374	4,292	1,082
1929-30	4,694	3,849	845

Balance of Trade.—The balance of merchandise trade amounted to $845,000,000 which compares favorably with the balance established in the preceding year when the total trade was greater.

Gold and Silver.—Heavy imports of gold continued the inward movement begun in the preceding fiscal year, resulting in a net import of the metal of $223,000,000. This was the largest gold import balance since the year 1923-24. Silver exports exceeded imports by $18,000,000.

TOTAL COMMODITY FOREIGN TRADE OF THE UNITED STATES, FISCAL YEAR 1929-1930

(Millions of Dollars)

	Exports	*Imports*	*Balance*
Merchandise ...	4,694	3,849	+ 845
Gold	119	342	— 223
Silver	72	54	+ 18
			+ 640

The invisible trade, as calculated on the basis of calendar years, would, if available, reveal an equilibrium between exports and imports. New foreign investments may be mentioned in this connection. For the fiscal year 1929-30, new foreign security issues floated in the United States amounted to $1,032,000,000, this movement having the effect of an import. The bulk of this capital flotation transpired in the first six months of 1930 when commodity trade was on a decline.

Export and Import Values.—Exports in the fiscal year 1929-30 registered a total of $4,694,000,000 as compared with $5,373,000,000 for the previous year, representing a decline of 12.5 per cent. Imports were valued at $3,849,000,000 as compared with $4,292,000,000, a decline of 10 per cent in value. A substantial portion of this decline may be attributed to the recession in commodity price levels.

COMMODITY CHARACTER OF EXPORT TRADE

Finished Manufactures.—Finished manufactured goods continued by far the greatest proportion of the exports, representing nearly 50 per cent of the total. No more eloquent testimony of the excellence of American manufactures may be found as year by year this proportion has tended upward from the pre-war average of 30.7 per cent. On the basis of the reduced value of the export trade, finished manufactures exported in 1929-30 were actually $215,000,000 less than in the preceding year.

Automobiles.—The recession in exports of automobiles, parts and accessories was alone sufficient to effect this reduction in the entire group. Motor vehicle exports declined 35 per cent or $207,000,000 in value from the preceding year.

Miscellaneous Items.—Reductions were registered in other important items of export, *viz.*, iron and steel tubular products, 5.1 per cent; structural shapes, 9.9 per cent; cotton manufactures, 21.3 per cent; cigarettes, 41.7 per cent; rubber tires, 17.1 per cent; paints and varnishes, 9.2 per cent; soap and toilet preparations, 5.6 per cent; musical instruments, 22.8 per cent; printing machinery, 13.4 per cent; textile machinery, 12.0 per cent; and illuminating oil, 17.0 per cent.

FOREIGN TRADE BY ECONOMIC CLASSES

Exports	*Crude Materials*	*Crude Foodstuffs*	*Mfd. Foodstuffs*	*Semi-Mfrs.*	*Fin. Mfrs.*
	%	%	%	%	%
1910-14 ..... (Average)	33.5	5.9	13.8	16.0	30.8
1928-29	23.5	6.1	9.1	13.8	47.5
1929-30	22.3	4.7	9.5	13.8	49.6
Imports					
1910-14 ..... (Average)	35.2	12.0	11.5	18.2	23.1
1928-29	35.2	12.7	9.9	19.8	22.4
1929-30	34.0	12.5	9.3	20.4	23.8

Gasoline and Oils.—Offsetting these declines were marked increases in other export lines, some of which are of leading importance. The two foremost petroleum products exported, viz., gasoline and lubricating oils, registered increases of 8.7 per cent and 3.3 per cent, respectively, over 1928-29.

Machinery Group.—Although a few items of machinery declined, machinery as a group increased 10 per cent, some of the specific advances being radio apparatus, 53.7 per cent; eelctric household refrigerators, 46.0 per cent; electric motors and locomotives, 20.2 per cent; construction and conveying machinery, 20.5 per cent; mining and quarrying machinery, 22.2 per cent; oil-well machinery, 25.6 per cent; power-driven metal-working machinery, 18.2 per cent; tractors and parts, 20.6 per cent; harvesting machinery, 2.3 per cent; and implements of cultivation, 10.3 per cent. Exports of photographic and projection goods showed a marked increase of 57 per cent over the preceding year.

Crude materials continued as the second group of exports, comprising 22.3 per cent of the total and continuing the decline in relative importance as successively shown since the pre-war period, when the group comprised 33.5 per cent of the exports. Unmanufactured cotton, the leading single article of export, registered a decline of 22.7 per cent in value and a shrinkage of 17.2 per cent in quantity as compared with the preceding year. Less important recessions are found in undressed furs but crude petroleum and tobacco showed increases.

Semi-manufactures, comprising 13.8 per cent of the total, occupied exactly the same relative position as in 1928-29, the decline in value being attributed mainly to the lowered exports of copper. In value, copper declined 23 per cent from 1928-29 and in quantity declined 26 per cent. Iron and steel products of a semi-manufactured type also declined, leather receded 18.5 per cent and various lumber products also declined.

Manufactured foodstuffs, with 9.5 per cent of the total, showed a slight relative increase over 1928-29 but continued the downward trend from the pre-war average of 13.8 per cent. Packing-house products, as a group, showed a decline of 3.8 per cent. This is accounted for by lowered price in spite of sustained quantity in shipments of fats, oils and lard. Meat products registered a small gain. Oil-cake and meal declined 26.4 per cent in value and 20.5 per cent in quantity while wheat flour practically maintained its position in the trade, the value showing a slight reduction.

Crude foodstuffs, with 4.7 per cent of total exports, suffered a substantial relative decline from the preceding year. Wheat, the leading item in the group, showed a reduction of 5 per cent, and recessions were noted in other grains as well as in apples.

COMMODITY CHARACTER OF IMPORT TRADE

Crude Materials.—The commodity character of the import trade was substantially the same as in the year 1928-1929 and it indicated no marked change from the pre-war period 1910-14. Crude materials continued as the leading group of imports, comprising 34 per cent of the total, compared with 35.2 per cent in the preceding year. Recession in world prices for many basic commodities brought about a decline in value which, in many instances, was greater than quantitative reduction. For example, raw silk, the leading single article imported into the United States, showed actually a slight gain in quantity but a reduction of 8.1 per cent in value. Crude rubber, the third article in importance declined only

7.3 per cent in quantity but, due to price recessions, the value shrunk 16.6 per cent. Raw cotton showed a quantitative reduction of 13.1 per cent, representing a value of 25.4 per cent lower than in 1928-1929. Other commodities in which a similar price situation is revealed include wool, with percentage reductions of 18.6 and 31.3, respectively. In the case of hides and skins, a slight decline in value was registered in spite of a quantitative increase of 22.6 per cent. On the other hand, crude petroleum declined 22.5 per cent in quantity and only 20.5 per cent in value; oil-seeds were reduced 18.2 and 12.8 per cent, and unmanufactured tobacco 20.3 and 14.8 per cent, respectively.

Finished manufactures comprised the second group of imports, with 23.8 per cent of the total. Newsprint, the leading article in the group and seventh in the import trade, showed an increase of 1.5 per cent in value and 7.9 per cent in quantity. Refined petroleum showed an enhancement of 30.2 per cent in value and 153.4 per cent in volume, while leather manufactures improved 26.7 per cent in value. These increases were offset by reductions in other commodities, *viz.*, cotton manufactures, 15.4 per cent in value; burlaps .9 per cent in quantity and 18.2 per cent in value; and wool manufactures, 21.9 per cent.

Semi-manufactures, comprised 20.4 per cent of the total. Copper, the leading item and fifth in the list of all imports, showed a slight increase in quantity, and 7.6 per cent improvement in value. Wood pulp also increased 4.8 and 2.0 per cent, respectively. The remaining important items in the group revealed the general downward tendency of the year. Tin declined 6.0 per cent in quantity and 18.6 per cent in value; fertilizers were reduced 8.6 per cent and 11.6 per cent; vegetable oils shrunk 1.1 and 10.8 per cent; and diamonds receded 12.2 and 35.6 per cent, respectively. Sawmill products, in spite of an increase of 1.3 per cent in quantity declined 4.4 per cent in value.

Crude foodstuffs, with 12.5 per cent, was the fourth group of imports. Price recessions were particularly pronounced in the leading items of this group. Coffee, the second article in the entire import trade, revealed a quantitative increase of 8.8 per cent with a corresponding value 16.8 per cent lower than in the preceding year. The average price of coffee declined from 21.5 cents to 16.4 cents. Cocoa, with a slight advance in volume, receded also in price and resulted in a reduction of 10 per cent in value. Fruits and nuts declined 2.2 per cent from the preceding year.

Manufactured Foodstuffs.—Sugar imports, being 23.4 per cent less in quantity and 25.4 per cent less in value, largely accounted for the decline in manufactured foodstuffs. Edible vegetable oils also receded 1.1 and 10.8 per cent, while meat products declined 20.1 per cent and 14.8 per cent, respectively. Vegetables and preparations showed an increase of 24.6 per cent.

GEOGRAPHICAL DISTRIBUTION OF EXPORT TRADE

Europe continued by a wide margin as the leading continent in the export trade of the United States, taking 46.3 per cent of the total. This was larger than the percentage taken in the preceding year and marks an interruption of the downward tendency of the past four years. Ins pite of the larger proportion, however, exports to Europe declined 9 per cent from the preceding year. Decreased shipments of cotton, copper, motor vehicles and grains, exclusive of wheat, largely accounted for the shrinkage in exports. Sales of gasoline and lubricating oil increased. The United Kingdom continued as the second foreign market for United States exports, taking 17 per cent of the total which was slightly greater than the proportion of the preceding year. Exports to every country of Europe, with the exception of Greece, Switzerland and the Soviet Union were less in value than in 1928-29. Augmented sales of electrical apparatus, machinery and agricultural implements were sufficient to offset a decline in cotton shipments to the Soviet Union and register an increase of 104 per cent in exports.

GEOGRAPHIC DISTRIBUTION OF FOREIGN TRADE BY CONTINENTS

Exports	Northern North America	Southern North America	South America	Total	Europe	Asia	Oceania	Africa
	%	%	%	%	%	%	%	%
1910-14 average	14.8	8.4	5.6	14.0	62.3	5.6	2.2	1.1
1928-29	18.6	7.8	10.3	18.1	44.6	12.8	3.6	2.4
1929-30	17.7	8.8	9.3	18.0	46.3	12.0	3.4	2.5
Imports								
1910-14 average	7.0	13.5	12.2	25.7	49.5	15.3	1.0	1.3
1928-29	12.0	11.1	14.3	25.4	30.3	28.5	1.3	2.4
1929-30	12.7	10.2	14.5	24.7	30.9	28.5	1.0	2.3

Latin America, as a recognized trade area rather than a single continent, was second in the export trade of the United States. Sales to Mexico increased over the preceding year and caused exports to Latin North America to remain at substantially the same value as in 1928-29 but with a greater proportion. Cuban sales continued to fall off. Of the South American countries, Chile alone showed an increase over the preceding year. Decline in the sales of motor vehicles, iron and steel, cotton goods and rubber manufactures created a general trade recession throughout the continent, while agricultural machinery and electrical apparatus enjoyed a higher value than in 1928-29.

Canada continued as the leading market for United States exports, purchasing 17.5 per cent of the total and comprising almost the entire share of Northern North America. With the general decline in trade, sales to Canada showed a decrease of 17.3 per cent from 1928-29.

Asia.—With two minor exceptions (British Malaya and Persia) exports to countries in Asia declined from the preceding year. The shrinkage in sales to the two leading Asiatic markets, China and Japan amounted to 21 per cent in each case. The decline in shipments of cotton, copper, motor vehicles, kerosene, tobacco and cigarettes, accounted largely for the lower trade values.

Oceania, comprising chiefly Australia and New Zealand, took a smaller amount of exports which represented substantially the same proportion. The decline in sales to these two countries was 20.1 and 4.5 per cent, respectively. Exports to British Africa fell off 17.2 per cent and accounted for the decline in trade with the continent of Africa, although sales to some of the less important countries showed an increase.

GEOGRAPHICAL SOURCES OF IMPORT TRADE

Europe.—For the third successive fiscal year, Europe was the leading source of American imports, providing 30.9 per cent of the total. Purchases from all important countries declined with the exception of Norway, Finland, Sweden and the Soviet Union. Imports from the United Kingdom were 18.0 per cent less, France 10.4 per cent less, Germany, 8.7 per cent less and Netherlands, 11.6 per cent less, smaller purchases of a wide variety of raw materials and foodstuffs accounting for the shrinkage.

Asia, with 28.5 per cent of the import trade, occupied the same relative position as in the preceding year. Imports from every country of prominence declined, the loss being occasioned both by smaller quantities and lowered prices for rubber, silk, burlaps, etc. Japan continued as the second source of American imports, providing 9.5 per cent of the total.

Latin America.—Imports declined in relative importance, as well as in value. Purchases from Mexico, Cuba and other countries of Northern North America were reduced 18 per cent from the preceding year. The decline of over $60,000,000 in the value of Cuban sugar imports and the smaller purchases of important Mexican products explain the drop. Of the South American countries, increases were shown only in imports from Argentina, Colombia and Peru. The lower average price of coffee caused a decline in imports from Brazil, in spite of the larger quantity purchased. A falling off in copper and nitrate shipments from Chile and in coffee and petroleum from Venezuela also contributed largely to the decline in imports from the continent.

Canada, with 12.5 per cent of the total imports was again the leading source of imports as well as the leading market for exports. Imports from Canada were 5.8 per cent less than in the year before, quantitative as well as price recessions accounting for the shrinkage.

Oceania.—With a decline of 29.6 and 35.8 per cent, respectively in the value of imports from Australia and New Zealand, Oceania registered a reduction in relative importance. As in the case of exports to Africa, imports from many unimportant areas were greater than in 1928-29 but the decline in purchases from Egypt and British Africa placed the continent on a slightly lower plane than it had occupied the previous year.

RAILROAD TRAFFIC AND EARNINGS

By G. Lloyd Wilson

Professor, University of Pennsylvania

GENERAL

The year 1930 is one that will be long remembered by the operating and traffic officers of railroads of the United States. The first eight months of 1929 was a period of record breaking freight traffic; the last four, however, fell below the corresponding period of 1928, and presaged the sharp and severe decline suffered in 1930, in which the traffic of each month fell below the standards of both 1928 and 1929. Business depression, the growing competition of water carriers, pipe lines and motor transport carriers cut deeply into railroad traffic and earnings. Passenger traffic and earnings continued the unbroken decline started in 1920, and the operating expenses and taxes of the railroads, although lower, did not decrease in proportion to the severe decreases in traffic and earnings, which resulted in a material reduction in the net profit of the railroad carriers. Despite this discouraging traffic and financial outlook, it is generally agreed that railroad freight transportation service was the best in history. In the last annual report of Robert P. Lamont, U. S. Secretary of Commerce, he states, in part: "The quality of service furnished by the railways, as well as by other public carriers, has continued to improve and is now better than at any other time in the history of the country. Car shortages have become rare occurrences. At present it takes only from one-half to two-thirds as long to move goods a given distance as it did a decade ago."

RAILROAD MILEAGE

Class 1 railroads,—those earning in excess of $1,000,000 per annum in railway operating income,—operated an average of 241,568 miles of line in 1929, and an average of 242,738 miles in 1930. The slight addition in miles of railway operated in 1930 as in other recent years was virtually offset by the mileage of railway abandoned. The railway net has increased only by 17 per cent since 1911, and by about 5 per cent since 1920. All railroads in the United States, including Class I, II, and III carriers, now operate approximately 260,000 miles of line, and 426,000 miles of trackage, including second and additional main line trackage, yard tracks and sidings.

RAILROAD EQUIPMENT

Locomotives.—In the beginning of 1930, Class I railways had in service 56,936 steam locomotives, and 601 motive units of other types, a total of 57,537 motive power equipment units. During 1929, 1229 new locomotives were placed in service and

3,133 were retired. The total tracture power of the locomotive in service amounted to 2,550,635,635 pounds, the lowest aggregate tracture power since 1923. This decrease in total tracture effort was offset by an increase in average tracture effort of nearly 1,000 pounds per locomotive, 44,798 pounds in 1930 compared with 43,838 pounds at the beginning of 1929. This is accounted for by the fact that larger and more powerful new locomotives replaced older and smaller types retired from service.

Cars.—The railroads of Class I in 1930 had 52,259 passenger train cars in service; while 108,364 company service cars, and 2,306,763 freight train cars were in service. During the year 1929, the Class I carriers retired from service 3,499 passenger-train cars and placed 2,663 new cars in service. In the same period 10,843 company service cars were retired and 10,824 installed. More freight-train cars were retired that were placed in service during the same period,—93,608 new freight cars were installed and 113,880 were dropped from service. The aggregate carrying capacity of freight cars in service in 1930 was 105,410,136 tons, and the average capacity 46.3 tons per freight car. Increases were recorded in the number of passenger cars of all-steel and steel underframe construction, and in all-steel and steel underframe construction in 1930. Older wooden and wooden underframe passenger cars have been gradually replaced with modern all-steel equipment.

Electrification.—During 1930 there was a significant increase in the electrification of steam railroad mileage, and in the use of electric, gasoline, gas-electric and Diesel locomotives.

Motor Trucks and Buses.—There was also a greatly increased use of motor trucks and motor buses by railroad companies, their subsidiary motor companies, or by bus or truck operating agents of the railroad carriers.

RAILROAD PERSONNEL

The Class I railways in 1929 employed an army of 1,660,920 employees, a slight increase over the number employed in 1928, but less than in any preceding year since 1916. Fgures of employment for the full year 1930 are not yet available, but the number of employees was approximately 8 per cent less than in 1929. The total payroll of Class I carriers in 1929 was $2,896,566,291, a slight increase over the aggregate compensation of $2,826,590,471 in 1928, but less than the payrolls of years following the World War. Total payrolls were correspondingly less in 1930. Rairoad payrolls in 1920 amounted to $3,681,801,193. The average hourly pay of employees in 1929 was 66.6 cents per hour, while the average annual compensation was $1,743.95; while the average compensation was $1,720 in 1930.

FREIGHT CAR LOADINGS AND CAR MOVEMENTS

Revenue Loadings.—Revenue car loadings in 1930 aggregated 45,850,000 cars, a decrease of more than 7,000,000 cars from the previous year's record of 52,948,000 cars, and comparing with 51,590,000 cars in 1928. For the first time in seven years there were no weeks in which the freight car loadings exceeded 1,000,000 cars. The average weekly car loadings averaged 882,000 cars per week in 1930, the peak for the year occurring in the week ending Aug. 30, when 984,504 cars were loaded. The all-time weekly record is 1,208,878 cars loaded during the week ending Oct. 26, 1926. The railroads carried 424,000,000,000 ton-miles of revenue freight traffic, 13.9 per cent below the revenue freight ton-miles in 1929. The percentage decrease was 14.3 per cent in the Eastern and Southern Territories, and 13.2 per cent in the Western District. The car loadings in 1930 were divided among the following groups of traffic:

	Cars	*Percentage*
Grain and grain products	2,240,000	4.9
Live stock	1,280,000	2.8
Coal	8,101,000	17.7
Coke	472,000	1.0
Forest products	2,380,000	5.2
Ore	1,657,000	3.6
Merchandise and L. C. L.	12,187,000	26.6
Miscellaneous	17,533,000	38.2
	45,850,000	100.0

Freight Car Movements.—The average daily freight car movement was less in 1930 than for 1929 and lower than the average for the past five years principally because of the number of surplus freight cars. For the first 10 months of 1930 the average mileage per freight car per day was 29.3 miles, compared to 32.8 miles, and 30.6 miles in the five-year period. The average freight train speed was higher in 1930 than in any previous year. The average speed of freight trains in 1930 was 13.7 miles per hour or 328.8 miles per day.

Locomotive Movement.—The average locomotive movement in 1930 was less than in previous recent years, because of the storage of surplus locomotives. The daily freight locomotive movement averaged 59 miles, compared with 65.6 miles in 1929. Passenger locomotives moved an average of 117.2 per day in 1930, and 120 miles per day in 1929.

Train Loads and Car Loads.—The average freight train loading in 1930 averaged 792 net tons per train in the first ten months of 1920, compared to 804 net tons per freight train in 1929 and 778 tons for the five-year period 1925 to 1929. The average freight car load in 1930 was 26.6 tons per car, a slight decrease compared with the averages of 26.8 net tons per car in 1929, and 26.9 net tons per car in the period 1925-1929. The decline in freight traffic is revealed by the daily average ton miles per loaded freight car. During the first 10 months of 1930 the daily average ton-miles per freight car per day was 481 ton-miles, compared with 557 ton-miles in 1929, and 526 ton-miles in the period 1925-1929. Increased operating efficiency of the railroads is shown in an increase in the gross tons per train hour which broke all records in 1930. The number of gross ton-miles per train hour was 25,869 in 1930 and 24,625 in 1929, an increase of 1,244 gross ton-miles, or 5.1 per cent. Freight train speeds broke all records in 1930 and continued the unbroken advance since 1923. During the first ten months of 1930, the average speed of freight trains, was 13.7 miles per hour, compared to 13.1 miles per hour in the same period of 1929; and 10.9 miles in 1923.

RAILROAD EARNINGS

Revenue and Expenses.—Total operating revenues in 1930 aggregated $5,365,000,000, a decrease of $987,000,000, or 15.5 per cent under the revenues of $6,352,000,000 in 1929. This amount represented the smallest revenue since 1919. Operating expenses in 1930 were $3,985,000,000, $569,000,000 or 12.5 per cent less than in 1929. Net operating income dropped from $1,275,000,000 in 1929 to $898,000,000, in 1930; a decrease of 29.6 per cent, and the first time since 1922 that the net income of the railroads has fallen below $900,000,000. Taxes in 1930 amounted to $356,000,000, a decrease of $46,000,000, or 11.4 per cent under 1929. The ratio of taxes to earnings, however, was higher than in any previous year, 6.6 per cent in 1930, 6.3 per cent in 1929, and 5.0 per cent in 1921. The operating ratio of American railroads, the ratio of operating expenses to operating income, was 74.3 per cent in 1930, compared to 71.7 per cent in 1929.

Freight revenue aggregated $4,105,000,000 in 1930, a decrease of $721,000,000, or 14.9 per cent below 1929. Passenger traffic earned $735,000,000 in revenue in 1930, a loss of $139,000,000, or 15.9 per cent.

Mail Revenue.—The revenue from mail traffic amounted in 1930 to $107,000,000, compared with $151,000,000 in 1929. This large difference is due largely to the back mail pay received by the railroads in 1929. The mail revenue in 1930 was, however, nearly $2,000,000, or 2 per cent below the average mail revenue for the period 1925-1929.

Express revenue amounted to $114,000,000 in 1930, compared with $148,000,000 in 1929, a decrease of 23.0 per cent; while revenue from all other operating sources amounted to $304,000,000 in 1930, a decrease of 13.9 per cent below the figure of $353,000,000 in 1929.

Unit Traffic Revenue—Class I carriers continued in 1930 to show a steady decline in revenue per ton-mile and per passenger-mile which has dated from 1921, the first full year following the general rate advance of 1920. The average revenue per ton-mile of freight traffic was 1.065 cents in 1930, compared to 1.076 cents per ton-mile in 1929, a decline of 1 per cent. The average revenue per ton-mile in 1921 was 1.275 cents; making a decrease of 16.5 per cent from 1921 to 1930. Passenger revenue per passenger mile unit fell from 2.808 cents per passenger mile in 1929 to 2.730 cents in 1930, a decline of 2.8 cents; and a decrease of 11.5 per cent from 1921 to 1930. These unit revenue losses are reflected along with losses in the volume of freight and passenger traffic.

RAILROAD EXPENSES

Operating expenses of American railroads were not reduced to as great an extent as the reduction in revenue, principally because many costs of railroad operation do not vary in proportion to the volume of traffic. Despite a rigid economy program operating expenses were reduced only 12.5 per cent. The expenses of operation were divided among the following classes as follows: maintenance of way, $731,000,000; maintenance of equipment, $1,027,000,000; Traffic expenses, $128,000,000; transportation expenses, $1,868,000,000; general and other expenses, $231,000,000, making total operating expenses $3,985,000,000.

Maintenance of way expenses were 15.3 per cent lower in 1930 than in 1929; maintenance of equipment expenses were 15.2 per cent lower, and transportation expenses were 11.5 per cent lower than in 1929.

INVESTMENT RETURN ON RAILROAD PROPERTY

Complete figures are not available for the full year 1930, but based upon the investment at the beginning of the year, the rate of return in 1930 was 3.41 per cent, compared with a return of 4.95 per cent in 1929, a loss of nearly one-third, and the lowest rate since 1921. Carriers in the Eastern District earned 3.84 per cent; in the Southern District, 2.68 per cent; and in the Western District, 3.18 per cent. The record of the carriers of the United States, based upon the investment at the end of each year,—the method followed by the Interstate Commerce Commission—is as follows:

End of Year	*Rate of Return*
1921	2.84%
1922	3.58%
1923	4.33%
1924	4.21%
1925	4.74%
1926	4.98%
1927	4.29%
1928	4.64%
1929	4.84%
*1929	4.95%
*1930	3.41%

* Beginning of year.

CAPITAL EXPENDITURES

The gross capital expenditures of Class I railways for the year 1930, based upon the reports submitted to the Bureau of Railway Economics for the first nine months of 1930, without allowance for retirements or abandonments, were between $875,000,000 and $900,000,000, one of the largest expenditures in any year since 1923. These expenditures have been made for new facilities and equipment, and there was a substantial contribution to the relief of unemployment and to the stabilization of industry. The railroads made noteworthy contributions to flood and drought relief through special rates in 1930, as was done also in 1929, a public service worthy of special mention.

SUMMARY OF CURRENT DEVELOPMENTS

Enumeration.—It is impossible in this brief summary of traffic and earnings to chronicle all of the noteworthy developments in the field. The following deserve special mention:

1. A severe decline in freight traffic revenue.
2. A severe decline in passenger traffic and revenue.
3. A smaller proportionate decline in operating expenses.
4. A rise in operation ratio.
5. A severe decline in net income.
6. A slight decline in the technical index of railroad efficiency com-

pared with the banner year, 1929, but an increase compared with other years.

7. Progress in full economy, freight train speed, and gross and net ton miles per train-hour.
8. Increased competition of motor trucks and buses.
9. The rapid expansion of pipe lines for the transportation of petroleum and natural gas.
10. The development of competitive water transportation.
11. The growth of hydro-electric and other electric power facilities which indirectly tend to reduce the movement of coal over the railroads.

Statement of Policy on Competition.—The railroad industry united in a declaration of policy through the Association of Railway executives issued on Nov. 20, 1930, which called attention to the competitive situation which confronted the railroads and urged national legislation to remove the inequalities of regulation under which the railroads labored, and the withdrawal of the Federal government from competitive transportation services.

CONTROL OF PRODUCTION

By William F. Notz

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OVERPRODUCTION AND ECONOMIC DEPRESSION

During 1930 overproduction and curtailment of production of raw materials and of manufactured goods developed into a problem of major importance in the United States and in foreign countries. Without examining whether, instead of overproduction, it was not rather a question of faulty distribution, underconsumption or economic maladjustment generally, the fact remains that governmental agencies and representatives of industry and labor throughout the country have taken recourse to methods of curtailment and control of production, as the chief remedial measure to stabilize business conditions. Secretary of the Treasury Mellon on Oct. 29, in a public statement, said that "the underlying causes of the present world-wide depression could be traced primarily to overproduction." The Director of the U. S. Bureau of Foreign and Domestic Commerce, William L. Cooper, in a public address on Nov. 2, stated that the principal cause of the country-wide trade recession was overproduction.

POLICIES OF THE FEDERAL FARM BOARD

Conditions.—During 1930, public attention was focused perhaps most on the wheat and the oil situation, although almost equally critical conditions have developed with regard to cotton, tobacco, grapes, copper, coal, lumber and other raw materials. The most outstanding event of the year has been the policy of the Federal Farm Board, in connection with the problem of overproduction. In September, Chairman Legge stated that financial assistance had been extended to 17 different classes of agricultural products.

Surplus Wheat.—In an effort to ease the difficult situation of the American farmer the Board bought wheat at the market price through the Grain Stabilization Corporation, and removed it from the market to relieve pressure upon the latter and prevent any considerable decline in prices. Of the total revolving fund of $500,000,000, authorized by Congress for this purpose, the Board has used $250,000,000 and holds at the close of the year approximately 6,000,000 bushels of wheat. According to Secretary of Agriculture Hyde, domestic production in the last seven years has outrun demand by an average of 43,000,000 bushels annually, piling up a surplus. In a statement made public by the Board on Oct. 31, attention was called to the fact that its Organic Act specifically directs the Federal Farm Board to investigate conditions of overproduction and advise as to the prevention of such overproduction. The statement of the Board then goes on to recommend decreased production in this country in two of the staple crops, wheat and cotton. On wheat it recommends that the American farmer should not in the future look to the export market to dispose of his surplus; that production should be gradually adjusted downward until a domestic consumption basis is reached.

Cotton.—Regarding cotton, the Board's statement said that there is a serious surplus for the present time, and for the next few years a sharp curtailment in cotton production will be likely to bring the growers more money than they would get for the quantity they are now producing.

Reduction in Crop Acreage.—A further move by the Federal Farm Board consisted in urging reduction of crop acreage by the farmers. In January the Board recommended to southern cotton growers that no land be planted which had not produced at least one-third of a bale per acre on the average of the last five years. A similar warning was directed by the Board in April to tobacco farmers in Kentucky and Tennessee. In March, the Board urged wheat growers to curtail their wheat acreage 10 per cent, and in August, the Board announced that 4.5 per cent less winter wheat would be seeded this year than last year.

Opposition to Board.—The policy of the Board has met with strong opposition, particularly among farmers in Kansas and organized labor, and was bitterly attacked also by commercial interests at the 18th annual convention of the U. S. Chamber of Commerce in Washington in April.

CALIFORNIA GRAPE CONTROL

In July the California Grape Control Board, with headquarters at San Francisco, was established with the aid of the Federal Farm Board. The Control Board has authority to decide when and where a surplus of grapes exists, and will purchase surplus stocks from growers at fixed prices. "Money for such purpose will be advanced by the Farm Board to be repaid out of the funds received for the payment of $1.50 per ton by the growers." The surplus crop will be manufactured in part into by-products for the account of the Control Board. Surpluses taken off the market may be marketed later if conditions warrant. Following its organization, the Board announced that in September it would purchase 375,000 tons of raisin grapes on the vines and that it expected to reduce the surplus of raisins 165,000 tons.

STABILIZING OIL OUTPUT

Conservation Movement.—Early in the year the petroleum producers of Oklahoma, Texas and California put into operation a conservation movement involving drastic limitations of output. Restriction by prorating agreements in individual fields, sanctioned by the laws of those states, and an understanding between refiners and producers, were depended upon to stabilize the industry. Following previous proratings, the daily average crude oil production in Oklahoma on Oct. 28, including about 10,000 oil wells not covered previously, was fixed for October at 550,000 barrels, for November at 545,000 barrels and for December at 535,000 barrels. In the Texas field production was restricted by the State Railroad Commission for 90 days, beginning Aug. 27, to between 764,000 and 784,000 barrels daily. Up to Nov. 1, the California producers operated under a state curtailment program allowing a daily production of 596,000 barrels.

Obstacles to Plans.—In the course of the year, the oil conservation plans met with serious obstacles caused: first, by improvements in gasoline production from coal oil, permitting refineries to gain an increasing amount of the refined product from the same volume of crude oil; second, by recalcitrant operators in one flush field or another; third, by the current business depression which tended to cut down the increase in consumption regarded as normal; and fourth, by conflicts with the antitrust laws. Earlier in the year, a decision by the United States Attorney General put a halt to the American Petroleum Institute's program of voluntary curtailment, which had allocated the domestic crude oil requirement of the United States at 2,573,000 barrels per day for the last nine months of 1930. On the other hand, the Supreme Court of Oklahoma upheld the oil and gas conservation law of that state by refusing to grant a writ that would have restrained the state corporation commission from enforcing its proration orders.

RESTRICTION OF COPPER PRODUCTION

Several international agreements made during 1930 for the proposed curtailment of production have a bearing on business conditions in the United States. At a conference in New York City, in October, American, Belgian and Canadian copper interests took steps to stabilize the world copper market. A plan was submitted to the conference providing for a cut of from 12 to 15 per cent in the world's copper production, or over 200,000 tons per year. Copper prices were quoted in New York in November, 1930, for home delivery at 9½ cents (advanced to 10 cents in the middle of the month) as against 18 cents at that time in 1929.

INTERNATIONAL NITRATE PACT

In July the foremost nitrogen producing countries, controlling almost three-fourths of the world's output, agreed to curtail production from 30 to 50 per cent of last year's output. Under the new agreement, which covers one year, Germany, Holland and Belgium are to reduce their production by 30 per cent; the synthetic manufacturers of France and Poland by 40 per cent; Great Britain, represented by the Imperial Chemical Industries, Ltd., by 50 per cent. At the same time a nitrate pact was concluded between the above-mentioned manufacturers of synthetic nitrogen and the natural nitrate interests of Chile, for the purpose of reducing production, stabilizing prices and promoting consumption. The cartel agreement became effective Aug. 1. A joint trade promotion organization is to be formed for the purpose of increasing consumption of nitrogen in agriculture, and there will also be an international sales organization to handle the exports of the member companies.

INTERNATIONAL TIN CARTEL

A world-wide restriction of tin output, including a two months' cessation of production in all important fields, was agreed upon in Paris in June at an international conference of tin producers representing a majority of the operators in Malaya, Nigeria, Dutch East Indies and Bolivia. It was the first time in the history of the tin industry that the world's producers of this commodity have been assembled in common council and reported officially to be in unanimous agreement on all points regarding output policy. Conditions in the world's tin markets are reflected by the price trend during the year. On Nov. 3, 1930, Straits tin was quoted in New York at 26 and on the corresponding date in 1929 at 40.

CUBAN SUGAR CRISIS

American interests, controlling 70 per cent of the capital invested in the Cuban sugar industry, have taken a leading role in stabilizing that basic industry, which in the course of the year reached a point of economic demoralization as a result of overproduction. In coöperation with the Cuban government a curtailment plan, the so-called "Chadbourne" plan, was agreed upon at a conference in New York City in October, 1930. The salient features of this plan call for the segregation, from the 1930 Cuban crop, of 1,500,000 tons of sugar. In an effort to expedite consummation of the plan, President Machado on Oct. 25 issued a decree placing an embargo on sugar shipments from Cuba for a period of 15 days. It is expected that the Cuban Congress will enact a sugar stabilization law at its next session, following the autumn elections. Representatives of American and Cuban sugar interests left for Amsterdam early in November for conferences with Java sugar producers and with representatives of sugar interests in Czechoslovakia, Poland, Hungary, Germany and Belgium, at which it is hoped to negotiate an international agreement for curtailment of production.

OVERPRODUCTION OF TEA

A reduction of tea production by British and Dutch planters was decided on during the year which will result in an estimated reduction of output for 1930 of from 55,000,000 to 60,000,000 pounds.

SURPLUS PRODUCTION IN MANUFACTURED GOODS

Surplus stocks of manufactured commodities added to the business depression during the year, particularly in the textile and automobile industries. Temporary shut-down of plants and reduction of working days and hours were resorted to in numerous instances and helped to swell the number of unemployed throughout the country.

INTERNATIONAL TRADE CONTROL

BY HENRY CHALMERS

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INFLUENCE OF DEPRESSION ON COMMERCIAL POLICIES

Economic Nationalism.—The economic depression that affected almost the entire world during 1930 has been a dominant influence in the trend of the commercial policy of most foreign countries during the year. The sense of common distress led several groups of countries to come together to consider various plans for closer economic coöperation, either by moderating the barriers to exchanges of goods or by common action in the marketing of surplus products. To the end of 1930, however, these various efforts at concerted action had shown little result. The majority of tariff changes and other measures for control of international trade actually adopted during the year by the various foreign countries seem, rather, the expression of a sense of an increased tension in international competition and of a sharper spirit of economic nationalism.

Immediate Relief Objective.—Whatever may be the final judgment as to the basic causes of the current world depression, most of the measures taken by the various countries during 1930 to control imports or to stimulate exports appear to have been directed primarily at the immediate difficulties experieced in each particular country, in the hope of relieving the domestic situation, at least temporarily. Various long-time projects and plans looking to basic remedies have indeed been widely discussed, but it remains for the future to show to what extent these will be brought into practical operation. The events of 1930 in the field of commercial policy may mark a permanent trend, or may prove simply a temporary phase, but, judging by the majority of actual events and measures put into operation, the year has seen a distinct drift toward intensified protectionism and restrictive nationalism.

OUTSTANDING DEVELOPMENTS IN CONTINENTAL EUROPE

Tension and Experimentation.—Unlike the case in previous years, the mere number of revisions of import tariffs and related measures during 1930 is not an adequate reflection of the year's developments in foreign trade control in Continental Europe. With the general business recession that developed late in 1929 aggravating the disturbed situation arising from the already existing European agricultural depression, it is not surprising that 1930 was a year of renewed tension in international competition and of considerable tightening up in commercial policy. In addition, the year was marked by experimentation with new devices and agitation for new arrangements in the field of foreign trade control.

Tariff Changes.—There were indeed five general or extensive tariff revisions on the part of that many European countries during 1930, with the general trend of the rates upward. More significant, however, was the state of unsettlement that led all but two of the Governments of Continental Europe to make some changes in their tariffs during the year, often affecting fairly important groups of commodities, with several countries making two or more series of limited changes during the twelve-month period. In the case of three countries, the tariff changes were practically all downward, and several made selective revisions that provided for decreases as well as increases, but the majority of the new European duties are higher than the old.

Agricultural Measures.—In about half of the European countries that increased their import tariffs during the year, various groups of manufactured commodities were affected, either for the purpose of protecting the market for home industries that were particularly depressed, or as a means of increasing national revenues or improving the trade balance. In all but five of the 24 countries making tariff changes, however, agricultural products figured prominently, reflecting the widespread concern of governments over the need for relief to the particularly depressed agrarian elements in their population. In fact, the year was marked by an extension of old schemes and a burst of new measures on the part of many of the countries of Europe, either to reserve the home markets or check the decline in prices for the domestic agricultural producers, by various forms of restriction on imports, or to assist in the disposal in other markets of surpluses with which they were burdened. The latter plans not infrequently involved exporting at prices below those of the home market and, in some cases, under stimulus of arrangements amounting to export bounties. The appearance of quantities of Russian grain and other products on various European markets during the latter months of the year, at prices that were regarded as foreshadowing a program of dumping, has increased the tension of the European competitive situation.

Protective Measures by Importing Countries.—The majority of grain-importing countries in Continental Europe increased their duties on wheat or flour, or both, during 1930 and several of them more than once. A third country was added to the two that already made the importation of cereals subject to restriction or license. Five European countries reinforced their protective duties by the requirement that given proportions of domestic wheat or flour be mixed with the imported. Several countries resorted to governmental monopolies or state controls of trade in one or more grains, a device that has come and gone in earlier years. To ensure quickly adjustable controls on imports, authority to change duties on cereals and other foods was, in a few countries, vested in the Minister of Finance or of Commerce. In a number of cases, the restrictive measures on cereals were extended also to hogs and meat products, while the idea of aiding domestic producers by requiring the mixing of a given proportion of domestic with foreign products was applied also to other commodities, principally the mixture of domestic alcohol with imported motor fuel.

Efforts to Stimulate Farm Exports.—Prominent among the European measures to aid exportation of food surpluses was the more active use, and at increased values, of certificates issued on the exportation of certain farm products and acceptable in the payment of import duties on the same or related commodities. Among the other arrangements were: the reduction or waiver of export duties; in one case, drawback arrangements distinctly stimulating exportation of domestic grain; and in at least two countries the payment of direct premiums on the exportation of cereals and hog products. Perhaps most far-reaching was the plan advanced by the agricultural countries of eastern Europe, although thus far without success, calling for special duty-concessions or other preferential arrangements on the part of the food-importing countries of middle and western Europe, favoring the purchasing of their surpluses rather than those from overseas or Russia, in return for improved markets in their territories for the manufactured products of western Europe.

OUTSTANDING DEVELOPMENTS IN THE BRITISH EMPIRE

Tariff Revision in Chief Dominions.—The year was marked by important tariff revisions in the four principal Dominions and less extensive changes in most of the British Colonies. Particularly notable were: the further marked increases in the Australian duties, enforced by restrictions or prohibitions on certain commodities, in the effort to help the trade balance and financial position of the country as well as to foster the development of secondary or manufacturing industries; the somewhat less extensive upward revision in New Zealand, marked by increases in the margin of British preference; and the two revisions of the tariff and customs law in Canada, the first (by the Liberal Government) designed to foster greater Empire trading as well as protect domestic industries, and the second (by the Conservative Government) for the distinct purpose of giving every aid to the lines of production already established in Canada and to invite others. By contrast, the limited tariff changes made by Newfoundland were almost all downward.

Other Tariff Changes. — Great Britain was almost the only British area making no appreciable changes in its tariff during 1930, beyond allowing the so-called "safeguarding duties" on a small group of commodities to lapse at the end of their term. Practically all other British areas made some changes in their duties during the year, including many areas not following the practice of an annual tariff bill. In the majority of cases, the 1930 duty changes were upward, and appear to fall roughly into two categories. Many of the areas producing sugar, flour, or butter, increased the import duties on these products for the protection of the home market; while others raised their duties on commodities regarded as luxuries, principally tobacco, matches, liquor, automobiles, tires, and gasoline, apparently for the purpose of increasing governmental revenues.

Proposals for Greater Empire Preferences.—The possibilities of bringing together the various British areas into a more self-sufficient economic empire, through the exchange of greater tariff preferences to encourage buying from each other rather than from outside countries, was the subject of exceptionally active discussion throughout the British Empire during the year. The discussions came to a focus at the Imperial Conference assembled at London in October, where the Dominions offered larger measures of preference in their import duties to English manufactured products, in return for the mother country adopting a more general tariff system, particularly on foodstuffs, which duties could then be rebated or waived to the products of the empire. This program was not acceptable to the MacDonald Government, which felt it was against the best interests of England to adopt a general tariff, and particularly to increase the cost of foods to her people and of raw materials to her industries. Nor was the English offer of import boards for the bulk purchase of foodstuffs, with quota preferences to empire producers, accepted by the Dominion Prime Ministers. The subject now goes over to the Ottawa Conference in 1931, with the possibility of a changed position on the part of England by then should the Conservative Party return to power. In the meantime, Canada and Australia are attempting to work out an additional preferential arrangement for diverting trade to each other; and similar negotiations between other sets of British areas are reported in contemplation.

DEVELOPMENTS IN LATIN AMERICA

General.—The changes in import duties during 1930 in at least five of the 20 Latin American Republics were sufficiently extensive or important to be regarded as general tariff revisions. In two of these countries, the overhauling resulted in an appreciable number of decreases in duties, but the great majority of the changes were substantially upward. In addition, six other countries effected changes in their tariffs of less extensive scope. Three general tariff revisions are reported to be in preparation.

Motives in Tariff Changes.—The prime object of the duty increases in most of the Latin American countries has usually been larger governmental revenues, although there are growing indications that several of these Governments are working on a program of more or less selective protection to aid existing lines of production, including some industries thus far existing only on a very small scale, and to encourage diversification into new lines of production, agricultural as well as industrial. In at least one important country, the purpose of duty increases was to help right the trade balance and improve the value of the national currency. The variety of objectives is illustrated by the fact that the tariff increases in one country might be on a group of manufactured articles apparently regarded locally as luxuries, including notably automobiles, tires, and petroleum products, whereas another of the same country might introduce decreases in duties on machinery or materials for production or construction. Two countries definitely enlarged the list of machinery and productive equipment which are admitted entirely duty-free.

Consular Fees.—The general need for increased governmental revenues on the part of many Latin American countries was also evidenced during 1930 in a number of increases in the consular fees, which are often collected as a percentage of the value of the shipment being legalized, and in the adoption of consideration of governmental monopolies on petroleum and matches.

Changes in Export Controls.—Possibly the most important among the long-run measures in Latin America were the numerous changes in the taxes, controls, and other conditions on the exportation of staple raw materials and foods, basic to the economy of these countries. Facing an accumulation of stocks, with sharp declines in foreign demand and market prices, Brazil arranged for the gradual liquidation of the coffee valorization plan maintained for some years; Chile abolished the export tax on nitrates, which was replaced by agreements with producing interests that are to yield certain revenues to the Government; while Cuban sugar interests, backed by the Cuban Government, are working on an agreement with the cane producers of Java and with the principal European sugar-beet countries, for concerted restriction of the exportation of sugar over a period of years. In the effort to stimulate foreign buying, half a dozen other Latin American countries reduced or abolished their export taxes on various products, particularly coffee, hides, cereals. Uruguay continued the export bounty on wheat, and proposed a bounty to grape growers.

Central American Agreements.—Two sets of Central American countries concluded agreements for the reciprocal free admission of certain natural products of the other; namely, Guatemala and El Salvador, Honduras and Nicaragua.

U. S.-Cuba Parcel Post.—The reestablishment of arrangements for parcel post service between the United States and Cuba, while of secondary importance, was an event of the year of particular interest to many American exporting firms.

DEVELOPMENTS IN THE FAR AND NEAR EAST

Chinese Tariffs and Taxes.—The Chinese tariff situation was the only one of particular activity in the Far East during the year. Aside from the conversion of the duties to a gold basis, as a measure of stabilizing customs revenues under the shifting values of the silver tael, the principal development was the announcement of a materially upward revision of the Chinese import tariff, effective Jan. 1, 1931. The need for increased national revenue appears the primary motive for the revision. It is also proposed that the long-standing internal taxes known as "likin" be replaced by other internal levies, less burdensome upon trade. While Chinese autonomy in tariff matters has been recognized by practically all the Powers, the treaty with Japan still limits the duties that China may impose upon cotton goods, flour, sugar, and certain other commodities produced domestically.

Japan.—Despite considerable investigation and recommendation for tariff changes on selected commodities, no action was taken by the Japanese Diet during the year, either on the tariff revision or on the proposal to delegate tariff authority to the Minister of Finance for a year as an emergency measure in view of the disturbance caused by the recent removal of the gold embargo.

Egyptian Autonomous Tariff.—With the lapse of the treaties limiting Egypt to a uniform levy of 8 per cent, and with the agreement of the Powers, Egypt put a revised autonomous tariff into operation early in 1930, carrying differentiated schedules of duties, partly for the declared purpose of fostering articles produced or believed producible in Egypt. The general agricultural depression affected the country toward the end of the year to the extent of bringing additional increases, in the duties on cereals, sugar, and other foods. Among the other countries in the near East, the tariff changes in Palestine and Syria also included increased duties on wheat, flour, and sugar, and selected manufactured products, notably automobiles.

Persian Restriction of Imports.—Persia introduced a stringent system of importation under permit upon a considerable range of manufactured goods, during 1930, as a means of improving the trade balance through drastic curtailment of foreign purchases.

NOTE: Discussion of the tariff situation in the United States is outside the scope of this article, which is concerned with the measures of control of international trade on the part of foreign countries. Certain aspects of the American tariff situation are covered elsewhere in this volume.

GOVERNMENTAL REGULATION OF COMMODITY EXCHANGES

By Arthur Richmond Marsh

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GENERAL OBSERVATION

The past year's violent decline of the prices of all the great commodities dealt in upon the exchanges devoted to future trading, with the resultant serious hardships for the producers of such commodities both in this country and in other parts of the world, has naturally directed an unusual amount of public attention to these markets and has excited not a little criticism of them in political and other quarters, as if the markets themselves were directly responsible for price phenomena which were in fact due to the operation of world-wide forces. The old charge has been renewed that commodity prices have been unduly depressed by the activities of bearish speculators on the commodity exchanges, and that the exchanges themselves have done nothing to prevent these activities or even to keep them within reasonable bounds. It follows as a matter of course that there has been a recrudescence of vehement demands on the part of politicians and other *soi-disant* spokesmen of the producers of commodities, especially of the producers of agricultural commodities like wheat and cotton, that the exchanges be abolished altogether or at least that they be subjected to a far greater degree of governmental supervision and regulation than has ever before been imposed upon them.

THE RUSSIAN WHEAT FUTURES CASE

Despite the pressure of the demands just referred to, neither Congress nor any other governmental authority in the United States has as yet undertaken to enlarge the scope of existing law with respect to the governmental control of transactions in the commodity futures markets. In one instance only during the past year has there been increased governmental interference with these markets; namely, when it was discovered at the height of the wheat-marketing season that the American representatives of the Soviet Government of Russia had made large sales of wheat future contracts on the Chicago Board of Trade, ostensibly as hedges against equivalent quantities of wheat in process of exportation from Russia, though plainly with no intention of delivering actual wheat against the contracts so sold, since our tariff effectually prevents such deliveries. This operation at once raised the question of the commercial legitimacy of the use of the American futures markets for the hedging of supplies of wheat and other agricultural commodities produced in foreign countries all over the world, especially when prices in such foreign countries are substantially lower than those obtaining in the United States. While it was strongly contended in trade circles that nothing should be done to deprive the American commodity exchanges of their international character, irrespective of the effects of the tariff in the way of protecting producers in this country, the Department of Agriculture and the Federal Farm Board, as well as the wheat coöperative associations, were equally strong in their opinion that such selling of future contracts from foreign sources necessarily tended to depress the price received by the American farmers for their wheat at the time their crop was being marketed. Accordingly, the Chicago Board of Trade was advised by the Department of Agriculture, which is charged by existing law with the supervision of the grain exchanges, that this use of the American grain futures markets for foreign account is officially held to be undesirable on grounds of public policy. As a result, the Board of Trade and some minor grain exchanges at once took action calculated to restrict hedging sales in those markets to American producers and merchants.

INCREASING NATIONALIZATION OF MARKETS

Effect On Price Relativities.—It may be said in this connection that a novel feature of the world's commodity trading during 1930 has been a pronounced tendency towards an increasing nationalization of the markets which have hitherto been regarded as completely international. Thus the world's wheat market, which in the past has been universally regarded as practically unified for all the great producing and consuming countries, with the exception of three or four European countries which protected their farmers by tariffs, is rapidly being split up into a series of national markets, each with its own price level for wheat maintained by forces not of a purely commercial nature. Hence the old price parities or differences between the different markets, which represented in the main only differences in transportation and handling costs, are rapidly disappearing and the price of wheat varies from country to country in a manner almost bewildering to the older members of the trade. At the end of the year, for example, the price of wheat in the United States, hitherto one of the principal wheat producing and exporting countries of the world, is more than 20 cents per bushel higher than the price in Canada, about 30 cents per bushel higher than the price in Argentina, and, when account is taken of transportation and other charges, almost 30 cents per bushel higher than the price in Liverpool, the world's accepted clearing house for wheat for generations past. On the other hand, owing to an extremely high tariff the price of wheat in Germany is almost $1.50 per bushel higher than in the United States, while for the same reason the price in France exceeds that in this country by almost $1.00 per bushel. In similar fashion, by reason of the tariff which Congress imposed upon long-staple cotton in the last Tariff Act, the price of 1⅛-inch cotton is more than 2 cents per pound higher than it is in Egypt and the price of 1¼-inch cotton is about 5 cents per pound higher here than it is there. The effect of these extensive changes in the traditional price relativities between the various world markets is, of course, to render exceedingly hazardous the arbitrage operations which were formerly relied upon to preserve practical price uniformity throughout the world for the principal commodities of international commerce.

Causes.—The chief causes that have been operative to bring about the conditions just described have been, on the one hand, the steadily increasing use of high tariffs by European and other nations in their supposed national interest, and, on the other hand, the expansion of governmental or quasi-governmental control over the marketing, and to some extent the production, of important commodities, as exemplified by the activities of the Federal Farm Board and of the closely allied producers' coöperative associations in the United States. The tendency in both these directions has unquestionably been much enhanced by the ruinous effects for great masses of commodity producers in all countries of the almost unprecedented decline in commodity prices in general which has occurred during the past year or so. In view of the desperate situation to which the agricultural producers of numerous countries would clearly be reduced if world forces of immediate supply and demand were given free play, the governments of these countries have felt incumbent upon them to endeavor to protect their respective farm populations by the application of measures of market control (whether involving higher tariffs, or regulation of imports and exports, or restriction of production, or direct financial assistance in support of prices), of a much more far-reaching character than any that have been attempted for at least a century past. Naturally, these measures of governmental interference have produced great irritation in the commodity trades affected and there has been an insistent demand from the members of these trades everywhere that governments should keep their hands off of business and allow the so-called law of supply and demand to operate as it formerly did, without regard to the consequences. There is, however, little to indicate that these commercial protests will receive much attention in governmental quarters.

THE OUTLOOK FOR ADDITIONAL REGULATION

Under these circumstances it is clearly possible that the great commodity exchanges in the United States and other countries will be much more sharply regulated by public authority in the future than they have been in the past. Concrete proposals to this end have not yet been adopted by the American or any other government, but it is hardly to be expected that a rapidly increasing degree of governmental control over the marketing of the great primary commodities will not be attended sooner or later by more extensive and more detailed public regulation of the operations of traders in the futures markets, since these operations may easily run counter to the marketing policies adopted by governmental authorities. What form this additional regulation is likely to take is, however, still impossible of determination.

PUBLIC PROTECTION OF SECURITIES

By William R. Shands
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GENERAL

The legislatures of twelve states were in session during the early part of 1930. Nine of these—Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia—were in regular session; the other three—New Hampshire, Texas and Utah—were holding special sessions. The year has accordingly been, in so far as legislation is concerned, an "off" year. Particularly true is this as to legislation regulating the sale of securities, only four of the states apparently making any changes in their securities laws.

STATE LEGISLATION

Massachusetts.—Bills affecting such laws appear to have been introduced in several states, but it is understood that only Massachusetts, Mississippi, New Jersey, and New York adopted any changes. In Massachusetts the changes consisted of eliminating from the exemption list securities issued by certain holding corporations (Chapter 316, P. A., 1930) and securities issued by corporations duly licensed to make small loans (Chapter 289, P. A., 1930). That the General Court, the legislative body of Massachusetts, might be better advised as to the effectiveness of the Massachusetts securities law, a resolution was adopted providing for a study and survey of the law by the Department of Public Utilities, to be followed by a report of its findings and recommendations to the General Court.

Mississippi now has a new Blue Sky Law, as Sections 4178-4198 of the new Mississippi Code of 1930 are known. The new code, adopted by Chapter 210, General Laws of Mississippi, 1930, provides that it takes effect Nov. 1, 1930 (Section 2, Code, 1930). Under the provisions of Section 3 of the Code of 1930, "from and after the said first day of November, 1930, all acts and parts of acts, the subjects whereof are revised, consolidated and reënacted in this Code, or repugnant to the provisions contained therein, shall be, and the same are hereby repealed, subject, however, to any express exceptions or regulations relating thereto, which may be contained in this Code." It thus appears its former Blue Sky Law is no longer in effect. Under the new act the Secretary of State is still charged with the administration of the law. Exempt securities and exempt transactions are provided for under the term "Exemptions." Non-exempt securities and securities sold in non-exempt transactions must be qualified and a certificate secured. No provision is made for qualification by notification, a feature found in so many of the recent acts. Before a certificate may be issued, the applicant must furnish a bond as required by law. The new act further limits the amount that may be expended to cover promotion and flotation expenses to 20 per cent; attorney's fees, charter fees, fees for certificates, franchise tax, stationery and office supplies are not included in determining the amount allowed.

New Jersey.—Two acts were passed, one — Chapter 52 — being amendatory of the law previously adopted to prevent fraud respecting securities offered for sale in the state, and the other—Chapter 51—being supplemental thereto. The former has made many changes in the existing law. The latter act, passed to supplement the law just referred to, invests the court of chancery with additional powers to prevent fraud and other illegal practices in the sale of securities.

New York.—The amendment in New York concerned the appointment of a statutory agent by foreign corporations (Chapter 232, Laws, 1930).

FEDERAL LEGISLATION

Sworn Information about Securities.—During the latter part of 1929 and the early part of 1930 four bills —H. R. 5060, H. R. 5412, H. R. 5658, and S. B. 3491—pertaining to the sale of securities were introduced in Congress. The first in the order mentioned—H. R. 5060, introduced Nov. 11, 1929—would make it unlawful to advertise or send through the United States mails, or otherwise offer for sale in interstate trade, any stocks, bonds, certificates, or foreign securities, without first filing with the Secretary of the Treasury a full and complete sworn statement giving full particulars as to the capital assets, and liabilities upon which the same are based, the book value thereof, and the names and addresses of the officers and directors of the organization proposing to make the offering. Subsequent reports must also be made to the Secretary of the Treasury, and, it is provided, the information shall be open to the press and the public to safeguard the country against worthless stocks, bonds, and securities.

Protection Against Bucketshops.—H. R. 5412 would make it unlawful for any person to deliver for transmission through the mails or in interstate commerce by telegraph, telephone, wireless, or other means of communication any offer to make or execute any contract, or any confirmation of the execution of any contract respecting the purchase or sale, either upon credit or margin, of any securities or commodities, as therein further defined, "(1) intending that such contract shall be terminated, closed, or settled according to, or upon the basis of the public market quotations of, or prices made on, any board of trade or exchange or market, upon which such commodities or securities are dealt in, and without intending a bona fide purchase or sale of the same; (2) intending that such contract shall be deemed terminated, closed, and settled when such market quotation of, or such prices for such securities or commodities named in such contract, shall reach a certain figure, without intending a bona fide purchase or sale of the same; or (3) not intending the actual bona fide receipt or delivery of any such securities or commodities, but intending a settlement of such contract based upon the difference in such public market quotations of, or such prices at which said securities or commodities are, or are asserted to be, bought or sold." Any place where any contract such as above referred to is made or offered to be made is, for the purpose of the bill, termed a "bucket shop"; persons are prohibited from keeping, conducting, or operating any such "bucket shop" in any territory or possession of the United States or the District of Columbia.

The provisions of H. R. 5658 are, in so far as they go, much the same as those of H. R. 5412. It is made unlawful by H. R. 5658 to deliver for transmission through the mails or in interstate commerce any offer to make or execute any contract, respecting the purchase or sale, either upon credit or margin, of any shares in any corporation or association intending that such contract shall be terminated, closed, or settled according to or upon the basis of, the public market quotations of, or prices made on, any board of trade or exchange or market upon which stocks are dealt in and without intending a bona fide receipt or delivery of the same.

District of Columbia.—By S. B. 3491, a copy of which we have been unable to secure, it is sought, we understand, to provide for the District of Columbia a Securities Law, the bill following more or less closely the "Uniform Sale of Securities Act," recently adopted by the Conference of Commissioners on Uniform State Laws and by the American Bar Association. The Public Utilities Commission is the body proposed to administer the law. So far efforts to bring the District of Columbia in line with the "Blue Sky" states have failed; this attempt will therefore be watched with interest. It is understood that these bills are now pending in committee.

UNIFORM SALE OF SECURITIES LAW

After several years of labor on the part of the committee charged with the duty of drafting a uniform securities law, there was adopted in October, 1929, by the National Conference of Commissioners on Uniform State Laws and by the American Bar Association, a "Uniform Sale of Securities Act." This act embodies many features already present in the laws of several of the states. It defines securities and thereafter provides for exempt securities and exempt transactions. All securities not thus exempt must be qualified. Two methods of qualification are provided, they being qualification by registration and qualification by notification. The securities which must be qualified are grouped so as to place in that group entitled to qualification by notification those securities which are least susceptible to fraud. Dealers and agents proposing to handle such securities are also required to qualify. No states have yet adopted the Uniform Law, although several at the time of the adoption of the act had laws more or less similar to it.

The Uniform Sale of Securities Law has been under discussion for a long time. Its adoption is a material step in the direction of uniformity so much desired by securities dealers handling national issues of securities and by various Securities Commissioners. It is hoped that the several states in making future changes in their securities laws will bear in mind the Uniform Act and in so far as may be done without depriving their citizens of the proper protection from securities frauds bring about greater uniformity in securities legislation and more efficient methods of combating the existing evil of securities frauds.

INVESTMENT TRUSTS IN THE UNITED STATES

By Leland Rex Robinson

President, Second International Securities Corporation

PRESENT STATUS AND RECENT PERFORMANCE

Growth.—It may be observed that the years 1929 and 1930 have been of crucial importance in the development of, and public attitude toward American investment trust companies and funds of all kinds. This applies as well to that great variety of financial institutions known as holding companies, finance and trading concerns, which a loose terminology has too often confused with investment trusts. This two-year period has witnessed the time of greatest growth (during the first nine months of 1929), as well as the most severe testing to which such companies have been subjected.

Capitalization.—In many cases it is impracticable to draw too academic distinctions in appyling the given definition of investment trusts. Frequently a single company will operate in part as an investment trust, while also seeking profits of the kind characterizing a holding, finance or trading organization. In January, 1929, the total paid-in bond and share capital of publicly owned American investment trusts, using the term in its proper meaning, amounted to approximately $1,100,000,000. Of this figure, the outstanding preferred stock totaled in the neighborhood of $460,000,000; the debentures and bonds were approximately $200,000,000; common stocks were $360,000,000; and beneficial certificates issued through trustees acting on behalf of contractual or common law investment trusts brought up the figure by the amount, roughly, of $80,000,000 more. No later compilation on this same basis has been made, and for this reason we are unable to compare the foregoing figures, which were arrived at as the result of careful analyses, with those at the present time. Probably the best general guide would be the figures of public financing prepared monthly by the *Commercial and Financial Chronicle*, whose tables report for all of 1929 a grand total of $2,223,730,898, and for the first nine months of 1930 the sum of $229,237,079, for "investment trusts and trading and holding companies," of which, as might be expected, approximately 95 per cent was in stocks in 1929, and only approximately 49 per cent in 1930. The greater part of all this capital for 1929 was obviously raised through sales of common stock for finance, trading, and holding companies, rather than for investment trusts, and it is most unfortunate that clear thinking on these matters has been obscured by the easy habit of lumping together such radically different companies, funds and common law trusts.

Consequences of Stock Market Collapse.—During late 1929 and throughout 1930 new financing has been largely for "fixed" investment trusts ("contractual type," see above), very little additional capital having been raised by general management investment trust companies or similar undertakings. The heavy collapse in stock prices in October and November, 1929, and in June and the fall of 1930 caused substantial impairment in liquidation values and drastic reductions in income on the part of these companies, the majority of which it would appear, showed better results than individual investors could have obtained, but in no way approximating the ambitious expectations of their organizers and shareholders. The consequence of this over-stimulated public interest has been a temporary swing to the opposite extreme of public indifference. Fixed investment trusts have been the beneficiaries of this current eclipse, owing to the elimination of the purely human equation of management in offerings of this sort, and to the small and convenient denominations in which their certificates are marketed. Decline in market values of investment company stocks of different kinds has been out of all proportion to the fall in their underlying asset values, which have been in numerous recent instances from 110 per cent to 150 per cent of the quoted prices. Fixed trust certificates, on the other hand, generally sell at a premium of from 5 per cent to 8 per cent above underlying values, the market price being currently fixed by reference to the latter.

NEW YORK STATE STATISTICAL SURVEY

Scope.—Considerable significance attaches to the report of Assistant Attorney General Watson Washburn of New York who, through the State Bureau of Securities, released on Aug. 1, 1930, the first results of a statistical survey of 270 leading companies and funds generally classed as investment trusts. Despite the fact that great improvement had been noted in the completeness of information given the public, it was deemed advisable to obtain full, accurate, and even confidential information by official questionnaires. Sixty-two per cent of the companies studied had been organized since the fall of 1927, which made all the more encouraging the following facts submitted in the resulting survey.

Results.—No irregularities were found in the reports submitted by any of the larger or better known companies. Only ten admitted participating in short sales. No borrowing was reported by ninety-two companies, while the balance sheets of seventy-three companies as of Dec. 31, 1929, revealed borrowing aggregating only 3.9 per cent of the total resources. The total net appreciation revealed on March 31, 1930, was substantially greater than the total net depreciation shown at the end of 1929, although of course the substantial drop in stock prices after that time will probably have made a late 1930 comparison considerably less favorable. The total resources of the 270 companies, which include forty fixed trusts, were over four and a half billion dollars at the end of March. At the time the survey was made public only three small companies had been enjoined from further business, either temporarily or permanently. A few important groups have been found subsequently in an unsound condition, such cases being generally connected with the suspension of sponsoring banking or stock exchange firms.

INVESTMENT TRUSTS AND THE STOCK MARKET

Financial Condition.—The great majority among the three hundred or more American investment trusts whose shares or certificates are held by the public appear to be in basically sound financial condition despite the brief period of existence covered by many of them. Many stockholders, or owners of investment trust certificates, have doubtless been keenly disappointed to discover that such securities do not carry in themselves any magic powers of immunity from overwhelming market forces; while numbers of investors in investment trusts, like purchasers of bank, utility, or industrial stocks, have lost heavily by ill-advised marginal operations or bank borrowings. In other words, investment trust stocks as a group during recent months have been in much the same position marketwise as many other listed and unlisted securities. Nevertheless, a careful check of actual results makes clear the relative advantages which have accrued to those placing their own funds in properly sponsored investment trusts, with a view toward outright and long-term ownership thereof.

Relations to Share Prices.—Some writers have blamed the stock market crash upon "investment trusts"; while others have registered surprise and alarm that the same institutions were unable, or unwilling, to block the downward tide. It must be obvious, however, that available cash resources aggregating only from a half billion to a billion dollars in cash or call loans of investment, trading and financial companies could not have stemmed such a torrent, even though the managers might have been foolhardy enough to throw their entire disposable funds into the buying of stocks after the markets struck only their first "air pockets." On the other hand, it is equally plain that the withdrawal of several hundred million dollars from call loans and banks for the purchase of stocks on the sweeping declines witnessed in October and November, 1929, must have contributed materially toward the restoration of public confidence, however disturbing to the banks may have been at the time the necessity for a quick replacement by their own loans of a part of the funds withdrawn by "others" from the call market. Finally, it is worth observing that to the extent abuses or careless practices will have proved to undermine the position of companies suffering heavy depreciation from unwisely timed investments, unsound accounting methods, or unhealthy pyramiding of paper values, this short-sighted management should become increasingly a thing of the past.

Principles of Management.—Such difficulties as have been encountered have arisen from needless neglect of clearly understood principles in the operation of investment trusts. Those funds and companies which have best withstood the market shocks of late 1929 and 1930 owe their favorable position to one or more of the following policies: (1) Wide distribution of risk among investments, involving bonds as well as stocks, representing a wide range of issuers, and often originating in other important industrial and financial countries than the United States; (2) continuous competent supervision of the investment holdings with no ulterior motives beyond the maintenance of the soundest possible investment position; (3) capital structure consisting wholly of capital stock, or of capital stock preceded by senior securities in such conservative ratios (as compared with the common paid-in equity) that the prior charges have been kept well within reasonable expectation of interest and dividend yield; (4) avoidance of bank borrowing, except in moderate amounts, and for purely temporary purposes; (5) maintenance of liquid position by confining investments mainly to high-grade, seasoned and marketable securities, and by holding reasonable proportions in the form of cash or call loans in order to take advantage of buying opportunities during periods of depression; (6) proper accounting at regular intervals; (7) sufficient size to permit the overhead required for capable management; (8) compensation arrangements for organizers or managers which are a matter of public record, simple in construction, and fair both to the public and themselves; (9) refusal to divert investment capital towards the salvaging of critical situations in the market for their own issues, or towards the maintenance of artificially high market quotations thereon; (10) offering of their shares at prices which bear careful analysis as regards book values and earnings, realistic appraisals of underlying securities, and reasonably low distribution outlays; and (11) constant emphasis upon the importance of accumulating reserves out of current cash earnings.

INCORPORATED FUNDS OF BANKS*

Advantages.—Interest attaches to the incorporated fund which will probably be increasingly used by trust company executives for the purpose of realizing the invetsment trust advantages of distribution of risk and continuous supervision in the administration of testamentary and voluntary trusts. The ground was broken in 1930 in this all-important field by City Bank Farmers Trust Company, formerly the Farmers Loan and Trust Company, with its Fund (C), Inc., and by The Guaranty Trust Company of New York, with its Fiduciary Fund Corporation. City Bank Farmers Trust Company Fund (C), Inc., differs from its Funds A and B in that the latter are uniform trusts rather than corporations, and are therefore of very limited usefulness in the management of most trust estates. The great majority of testamentary and voluntary, or "living", trusts require the reinvestment of profits as part of the principal of the estate accruing to the remainderman. On the other hand they call for distribution of all ordinary income to the beneficiary, the interests of beneficiary and remainderman generally being quite distinct, as set forth in the terms of the trust instruments. The management of investment funds along coöperative lines would be unduly handicapped, however, if arbitrary requirements were to prevent the writing of realized profits into income, or the creation of reserves out of income from all sources. In following the commonly accepted principles of reserve accumulation and inclusion of profits in income, it is evident that calculation of the respective interests of beneficiary and remainderman would be extremely difficult in any ordinary trusts except where, as in the uniform trusts, the beneficiary is also entitled to the principal.

Value of Corporate Device.—By use of the corporate device, however, the necessity is avoided of keeping such complex records, while at the same time earnings are calculated and reserves built up in the ordinary way. To the extent that trust funds are invested in securities of an incorporated mingled fund, it is simple to calculate the income which accrues to each, as this is the actual interest or dividends paid on the bonds or stocks issued by the incorporated fund. Whatever is not distributed by the corporation remains to enhance the principal. The incorporated fund of course pays the corporate income tax, which is at a higher rate than the normal personal income tax rates, but the beenficiaries of each trust fund pay no normal tax on any dividends received and only the personal rates on any interest received. How readily the corporate device lends itself to the requirements of the ordinary living trust, revocable or irrevocable, the insurance trust, or the testamentary trust (under which the trustee is usually required to distribute all normal income and to accumulate all profits), appears from the fact that a corporation may treat as income any profits realized by it, and may withhold from current distribution any part of its aggregate net income which in the judgment of the directors should be reinvested to build up surplus. When the trustee is permitted to mingle the funds of such trusts through the corporate medium, reserves may be accumulated without feeling on the part of the beneficiary that his income has been impaired on behalf of the remainderman. Similarly, low-yield securities may be purchased in expectation of profit without necessarily diminishing the ultimate return to the beneficiary, for the remainderman cannot complain if such profits are regarded by the incorporated fund as income. In either case the beneficiary receives all the income derived from the securities of the incorporated fund held in his trust estate, and the remainderman receives all the principal, as represented by these securities. Upon death of the beneficiary, or beneficiaries, the trust estate, if invested in this corporate medium, does not have to be broken up into separate entities for administration, as happens when trusts revert to the estate under such circumstances. Where retirement does not take place, the mingling of funds may continue indefinitely after the death of the beneficiaries, as the carrying out of the terms of the different trust instruments does not necessarily disturb the machinery which has now been set up for realizing the advantages of coöperative investment.

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* For more complete technical description the reader is referred to "Investment Trusts," *The Journal of Business*, University of Chicago, Vol. III, No. 3, July, 1930, and "Investment Trusts in a Bear Market," *Business Bulletin*, School of Business and Civic Administration, College of the City of New York, November, 1930, by the same author. For definition and scope of various investment trusts organizations see AMERICAN YEAR BOOK for 1929.

Operation of Incorporated Fund.—Thus it is that Fund (C), Inc., has been set up solely for the benefit of the trusts for which City Bank Farmers Trust Company acts as trustee and only in those cases where instruments establishing trusts or the terms of wills include, or are amended to include, appropriate provisions. These must specifically permit joint administration of trust investments, by means of such a device as the incorporated Fund, through mingling the funds of different estates with respect to which the trustee has been granted authority to do this. Participation in the Fund takes the form of units made up of $100 par value income bond and one share of capital stock. In this way, both the City Bank Farmers Trust Company and the Guaranty Trust Company are endeavoring to combine the unlimited trust services called for under any declaration of trust (whether created under a will, an insurance agreement or any other form of trust) with the facilities of investment diversification and detailed attention to portfolio requirements available to a large jointly administered fund.

THE OUTLOOK

No doubt many smaller companies, realizing more and more the difficulties of proper investment supervision without a large enough volume of capital to permit the employment of full-time staffs, will merge among themselves, or with some larger organization, or will enter into supervision contracts of one kind or another. This massing of investment funds will add greatly to the efficiency of management, and strengthen and broaden the markets for investment trust securities. The quality of sponsorship for the investment trust movement will be raised above present standards by the greater interest of leading banks and reputable banking firms. The notable progress made by several of the former in the improvement and extension of their various uniform trust funds, and in the application of the corporate device, should be continued in the new year, while the further study of estate administration, inheritance problems, and living trusts should make stronger the coöperative ties between insurance companies and banks on the one hand, and ably administered investment trusts and banks on the other. The next few years will probably be a period of stabilization, standardization, and progress, in part through processes of trial and error. Whatever may be the experience during these formative years in the development of American investment trusts, the consensus of informed opinion points to the permanent and important place which these institutions are bound to occupy in our financial life. They have been substantial buyers of securities at prices reflecting the pessimism of the general public during a major bear market. With few exceptions they have not hit the "highs" in selling, or the "lows" in buying, but evidence is plentiful that they are making reasonably liberal use of their funds in what will probably be regarded, when time gives a better perspective, as a favorable accumulation period. Far from terminating American interest in this approach to investment problems, the setback of 1929-1930 has probably come in plenty of time to bring investors, organizers, and managers into sobering touch with realities before any serious abuses had firmly established themselves.

BANKING AFFAIRS

By Gurden Edwards

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BANKS AND RESOURCES

Expansion In Resources.—There were 24,079 banks of all classifications in the United States on June 30, 1930, with aggregate resources of $74,020,000,000. This was a decrease of 1,251 banks as compared with the number on the corresponding date in 1929, and a rise of $1,847,000,000 in point of resources. These data reveal that the decrease in numbers was at a markedly greater rate than the 1929 change in this item which recorded a loss of 883 banks, while the expansion in resources was more than three times as great as the 1928-29 rise, which was $599,000,000. Aggregate capital, surplus and undivided profits of American banks June 30, 1930 amounted to $10,010,000,000, a rise in a year of $200,000,000 in these items, or less than a fourth that of a year previous. Total deposits were $59,850,000,000, an increase of $1,940,000,000 as compared with a decrease of $503,000,000 recorded for this figure the previous year.

Contributing Factors. — This change in direction of developments in bank deposits was indicative of underlying economic and financial phenomena of the year. It was attributable in part to the factor of the withdrawal by many individual and corporate interests of funds from direct loans in the call money market, returning them to the banks, which took over a larger proportion of the stock exchange loan account remaining after the securities market deflation, and also increased their other collateral loans and investments. A specific factor, also, in swelling total bank deposits was a rise in savings deposits attributed to cautionary savings by many against hard times, which in turn tended later to reduce this factor again in the fall and winter months of unemployment subsequent to the mid-year data here given.

Shrinkage In Number of Banks.—The official reports on banks by classes show there were on June 30, 1930, 7,252 national banks, a drop in a year of 184 in this class; 13,582 state chartered commercial banks, a drop of 855; 1,564 trust companies, a drop of 44; 1,320 savings banks, a drop of 38; and 361 private banks, a drop of 30. These figures show that every class of bank suffered in the general shrinkage in numbers. Consolidation of banks into larger units both in city and country districts continued to be an important development in banking during 1930 as in 1929, giving the nation fewer but larger and stronger banking institutions on the general average. A more drastic factor, however, was that of an unprecedented scale of bank failures which became more severe in the latter half of the year not covered in the fiscal year comparisons used in the foregoing, and therefore both fiscal and calendar year comparisons must be made.

BANK FAILURES

Closures and Liabilities.—Between June 30, 1929 and June 30, 1930, official reports show there were 640 bank closures, as compared with 549 in the previous comparable period; while for the eleven months from January through November, 981 banks were closed with deposit liabilities of $515,500,000, as compared with 590 closings for the similar period in 1929 with deposit liabilities at $218,800,000. Unofficial reports placed the nation-wide total for the year 1930, including December, when a New York City bank failed with deposits of about $180,000,000, constituting the largest bank disaster that ever occurred in American banking history, at about 1,100 bank closures with aggregate deposits of some $750,000,000. Although several large cities had bank failures, the great majority occurred in smaller cities and in the rural districts.

Causes.—The causes were adverse agricultural conditions resulting from the drought, falling prices and other factors impairing the assets in country banks; the existence of too many banks in many places; insufficient capital strength to withstand adversity in numerous cases; the impairment of investment values and business obligations making up banking assets as a result of the general economic depression; mismanagement and questionable operations in a few instances, and also panicky runs by depositors in some cases brought about by ignorant rumors, "red" propaganda and also natural mass fears engendered by actual conditions. It was notable that independent unit banking, chain and group organizations and large branch bank systems were all represented in the lists of failures.

ANALYSIS OF THE BANKING SITUATION

Safeguards.—Regarding the situation Rome C. Stephenson, President of the American Bankers Association, said: "Bankers recognize their business carries especially heavy public responsibilities. Unceasing efforts to bring about continually improving methods to safeguard depositors in banks of all kinds have been uppermost in the plans of bankers' organizations throughout the nation, not merely as the outgrowth of the past year, but for many years, and have resulted in great progress along lines of better, safer banking methods. Banking conditions have been far less severe than they would have been had not bankers been widely successful in their endeavors to develop the high standards that now generally prevail. It is clear the future calls for further efforts along these same lines.

Government Supervision. — "The American Bankers Association and bankers' organizations in every state activity support the principle of government supervision of banking. Present laws adequately enforced contain ample provisions for government supervision. Bankers universally believe in strong, capable banking departments manned by officials with the discretion and courage to enforce these laws and act under them as the common welfare demands. They believe that these public officials should be paid sufficient salaries to command the services of men of character, ability and a resolute spirit of public service. They believe also that the banking departments should be kept free from all political or other improper influence in order to be able to act at all times with single-minded independence solely for the benefit of the public interest.

Depositor's Obligation. — "Although banks are subject to supervision of public authority, they are strictly private business enterprises. The function of government is to promote and enforce careful banking administration, but this does not relieve the individual depositor from the necessity of judging and choosing carefully as to his banking relations, just as in his other business or professional relations. He must inquire for himself into the character and type of institution and men he shall do business with, satisfying himself as to their reputation, reliability and capability. These qualities are essential to complete the element of safety and dependability in any human institution.

Community's Obligation.—"While upon the individual bankers there rests without qualification the direct responsibility for the prudent, honest conduct of their institutions, nevertheless the soundness of banking as a practical matter of fact is a community problem in which the public has a part to play as well as bankers and government officials. The assets of a bank, outside its government bonds, consists mainly of loans to business men and of investments in securities created by corporate enterprises. If there were no such thing as unsound business men or enterprises there would be no such thing as unsound assets in a bank.

Factors In Banking Standards.—"Again the existence of a bank is dependent on public patronage and if only banks were patronized where the most careful policies were practiced and the most conscientious and able men in charge, it would go far toward maintaining the standards of banking. It is an unfortunate fact that the banker who is strict, 'hard boiled' if you please, is liable to be less popular than the 'easy' banker, and by that same token the public itself has a voice in influencing the character of banking. Still again the public can exert an influence in shaping the character of banking by supporting the purposes of bankers to maintain intelligent, independent, honest banking supervision by the public banking departments through insisting that this function of government shall be kept as free from political influence as the judiciary itself and shall be manned only by men of the highest ability and character. In still another way can people contribute to maintaining the ability of their banks to meet their obligations, and this is by granting them the fullest possible confidence. In many cases of bank troubles the only thing wrong with a bank is an unduly suspicious and apprehensive state of mind in its customers created by no act or condition of its own but by baseless rumors which sometimes led them to destroy the value of their own deposits by demanding them immediately, forcing a bank to sacrifice its assets and otherwise disrupt its financial operations.

The Outlook.—"The events of the year have brought about a stronger banking situation by eliminating some undeniable weaknesses. Only a small fraction of total banking figures was affected and even a smaller amount of deposits will actually be lost since most closed banks will pay in full or large part. The vast majority of bank resources were not involved at all. We can truthfully say we will have as a result of these curative conditions the strongest banking situation we have ever enjoyed and one that is worthy of the highest confidence of all our people."

BRANCH BANKING

Modification of Policy.—The question of branch *vs.* single unit banking continued to be a major item of discussion. The Economic Policy Commission of the American Bankers Association completed an extended study and following the presentation of its findings by its Chairman, R. S. Hecht of New Orleans, at the Cleveland convention of the Association in October, it modified its long-established anti-branch banking policy in the following terms: "The future demands the continued growth and service of the unit bank in areas economically able to support sound, independent banking of this type, especially as a protection against undue centralization of banking power. Modern transportation and other economic changes, both in large centers and country districts, make necessary some readjustment of banking facilities. In view of these facts this Association, while reaffirming its belief in the unit bank, recognizes that a modification of its former resolutions condemning branch banking in any form is advisable. The Association believes in the economic desirability of community-wide branch banking in metropolitan areas and county-wide branch banking in rural districts where economically justified. The Association supports in every respect the autonomy of the laws of the separate states in respect to banking. No class of banks in the several states should enjoy greater rights in respect to the establishment of branches than banks chartered under the state laws."

Plea For Broader Privileges.—The Comptroller of the Currency later in the year renewed his plea of the year before for broader branch banking privileges for national banks on the basis of the "trade areas" in which they operate. His position was that such a policy would do away with the need of the chain or group bank method of reaching out to create stronger bank conditions in rural districts, would lessen the danger of bank failures and would stop the defection of national banks from the national system to the state bank systems with their more liberal operating advantages, by making national charters more desirable.

INCREASE IN SAVINGS ACCOUNTS

A moderate increase in the nation's savings accounts in banks was reported by the American Bankers Association Savings Bank Division, whose annual compilation showed that this figure had gained $267,180,000 in the year ended June 30, 1930 as compared with the shrinkage of over $195,000,000 reported by it for the year ended June 30, 1929. The number of savings depositors increased very slightly during the year covered. The loss of the lure of the stock market and affiliated activities to attract savings from their more secure harbor in banks was cited as part of the explanation for the changes, coupled with prudent increase in savings against growing adverse times. The statement showed that savings deposits in banks and trust companies of continental United States on June 30, 1930 stood at $28,485,000,000 and that there was a total of 52,769,175 savings depositors.

CONVENTION OF AMERICAN BANKERS ASSOCIATION

Discussion.—The American Bankers Association, with a membership of about 20,000 national and state commercial banks, trust companies and savings banks comprising over 90 per cent of the nation's banking power held at Cleveland, in 1930, its fifty-sixth annual convention at which leading topics of discussion related to questions of chain, group and branch bank organizations as against independent or single-office institutions, ways and means for further improving bank management, the development of more scientific and professional elements in banking, bank failures, the promotion of regional clearing house organizations and examination systems and the defense of banks against discriminatory taxation. Atlantic City was designated as the meeting place for the 1931 convention.

General officers of the Association elected for 1930-1931 were: President, Rome C. Stephenson; Vice President, St. Joseph County Savings Bank, South Bend, Ind.; First Vice President, Harry J. Haas; Vice President, First National Bank, Philadelphia; Second Vice President, Francis H. Sisson, Vice President, Guaranty Trust Company, New York; Treasurer, Grant McPherrin, President, Central National Bank and Trust Company, Des Moines.; Executive Manager, F. N. Shepard, American Bankers Association, New York.

TRUST BANKING

By Gilbert T. Stephenson

Vice President, Equitable Trust Company, Wilmington, Del.

GENERAL

Exposition.—Trust banking is a permissible phrase only because trust business in the United States is carried on almost exclusively by banking institutions. Trust business itself is not banking in any generally accepted sense of the word; it is, instead, the business of settling estates for natural persons as executor or administrator and of administering trusts and performing agencies for natural persons, business organizations, and public institutions and agencies.

Developments.—There have been five noteworthy developments in trust banking, so understood, in 1930. The first is the increase of trust business of national banks; the second, new appreciation of the trust department as a stable and dependable and, to some degree, a proportionate contributor to the profits of the institution; third, application of the commingled-fund idea to trust investment requirements; fourth, attention towards the unification and standardization of trust laws and practices; and, fifth, the momentum gained in the life insurance trust movement.

NATIONAL BANKS IN THE TRUST FIELD

State-chartered banks and trust companies have been engaged in trust business, theoretically at least, over one hundred years—since 1822—national banks only since 1915. Of the 24,872 banking institutions in the United States in September, 1930, only about 7,232—one-third—are national banks. Aug. 31, 1930, there were 4,246 members of the Trust Company Division of the American Bankers Association which includes practically all the banks and trust companies actively engaged in trust business. Of these 4,246 there were only 1,387 trust companies so called. The balance are national, state, and savings banks of which 1,618 are national banks. The significance of this is that charter lines are making less and less difference, that banking institutions of all types are engaging in trust business, and that they have a practical monopoly of corporate trust business. The last statement is worth noting because in England banks do not have a monopoly of corporate trust business; instead, life insurance companies, safe deposit companies, investment companies, and corporations of several other types are authorized to settle estates and administer trusts.

TRUST DEPARTMENT EARNINGS

Too often the trust department has been regarded as a service department only and not a profit-making department of the bank. It was frequently expected to render a multitude of free services for the customers of other departments on the theory that the additional goodwill gained for the institution as a whole would more than make up for the loss to the trust department. It is a fact that the earnings of a trust department are, comparatively, much less than the earnings of other regular departments of a bank or trust company. A dollar on deposit subject to check in the commercial banking department, for example, will earn for the stockholders of the company, it may be, as much as ten dollars will, held in trust in the trust department. In years of prosperity, when the demand for money is active and profits of commercial banking correspondingly satisfactory, the modest and, sometimes, meager profits of the trust department constitute an inconsiderable part of the whole. But in a period of depression the profits of the trust department, though still small, are, nevertheless, only slightly affected by temporary business conditions. Times of depression dispose men to withdraw from the field of speculation and to think more favorably of living trusts from which the income, though modest, is sure. Trust bankers the country over are experiencing a new appreciation of their trust department earnings as the back-log of profits. The practical effect of this is likely to be that the trust department will be accorded an even fuller recognition as a coördinate department of banking institutions and that it will be operated more generally for its own sake and not as an auxiliary to other departments.

COMMINGLING TRUST FUNDS

An age-old principle of trust administration has been that there should not be any commingling of trust funds, either the funds of different trusts with one another or the funds of the trusts with those of the trustee. During 1930 especially, there has been a reconsideration of this principle with a view to adapting it to modern trust investment requirements. During the period of inflation that accompanied and immediately followed the war, trustees and beneficiaries were made keenly to feel the difference between money income and real income. As the purchasing power of the dollar diminished, trustees whose funds were invested in bonds or other fixed income-producing securities found themselves unable to provide adequately for the requirements of beneficiaries. This led trust bankers in general to consider the desirability of investing trust funds in common stocks, on the theory that dividends come nearer reflecting real income than the interest from bonds or mortgages. There was precedent for so doing in that trustees in Massachusetts, under the rule announced in 1830 in the case of Harvard College *vs.* Amory, had been investing trust funds in common stocks. Simultaneously with and, no doubt, partly because of the agitation in behalf of common stocks for trust investments, testators and creators of trusts began to give trustees absolute discretion in the selection of trust investment, expecting, of course, that they would invest partly or even principally in common stocks. Then came the violent break in the market in October, 1929. Trustees were made to realize that common stocks alone were not adapted to trust investments —certainly not for short-term trusts. This led to a reconsideration of the adaptability of the investment trust idea to trust investment requirements —a reconsideration, because it had been considered before but had been discarded in most trust banking circles.

UNIFORM TRUSTS

The renascence of the investment trust idea materialized during 1929 in the establishment of so-called uniform trusts. Three enterprising trust companies in New York City—City Bank Farmers Trust Company, Irving Trust Company, and Brooklyn Trust Company—offered the investing public a new form of investment in a commingled fund under the exclusive management and control of the trust company. Investors received, not separate certificates of stock or bonds, but a certificate of participation or of beneficial interest in a huge trust estate, thus giving the investor with only $5,000 the same opportunities for diversification and capital gains as the investor with many millions. This type of trust has a limited field in that it is not adapted generally to the requirements of miscellaneous trusts—trusts under will, by agreement, revocable, irrevocable, short-term, long-term, with full discretion or limited discretion or no discretion as to trust investments.

MISCELLANEOUS TRUST REQUIREMENTS

The year 1930 is noteworthy in the field of trust investments in that for the first time the commingled fund idea has been adapted to miscellaneous trust requirements. In May, 1930, the City Bank Farmers Trust Company of New York City established its Fund C, Incorporated, which is an *incorporated* commingled trust fund under the exclusive control and management of the trust company and for the exclusive use of its trusts. In June, 1930, the Equitable Trust Company of Wilmington, Del., established and announced its Equitable Funds A and B, both of which are *unincorporated* commingled trust funds serving identically the same purposes as the City Bank Farmers' Fund C. Fund A is composed of common stocks, preferred stocks, bonds, and mortgages and other securities selected according to the absolute discretion of the trustee; Fund B is composed exclusively of statutory trust investments and is designed for court trusts and others in which the trustee is limited to "legals." City Bank Farmers' trusts participating in its Fund C own stocks and bonds of the corporation; trusts participating in Equitable Funds A or B own certificates of beneficial interest. The City Bank Farmers' and the Equitable's are the two typical commingled trust funds for miscellaneous trusts —one incorporated and the other unincorporated.

STANDARDIZATION OF TRUST LAWS AND PRACTICES

The year has marked a definite and significant advance towards the modernization and standardization of trust laws and practices. It must be borne in mind that estates are settled and trusts administered, for the most part, under state laws and practices, and not under acts of Congress, which means that there are 48 different systems, all alike in many respects but in others differing to the point of tantalizing lawyers and trust men. A similar situation existed in England until 1925, when, almost overnight it seemed, the Lord Birkenhead Acts gave to England and Wales modern, uniform laws of administration, codified principally in the Administration of Estates and the Trustee Acts. A start in the same direction has been made during 1930, though it may be 1940 or even later before it takes full shape. In February, 1930, Dean Charles E. Clark of the Yale University School of Law and draftsman of the Uniform Principal and Income Act of the National Conference of Commissioners on Uniform State Laws, presented at the Mid-Winter Trust Conference in New York City the findings and conclusions of his committee. This act is still in process of revision and, when put into final shape and accepted by the Conference, will begin its tortuous way through the 48 state legislatures. More recently the National Conference of Commissioners on Uniform State Laws has appointed a Committee on Uniform Trust Administration Act of which George G. Bogert of the University of Chicago Law School is chairman. The Trust Company Division of the American Bankers Association has appointed a Committee on Fiduciary Legislation of which Judge Edward J. Fox of Easton, Pa., is chairman. These two committees, one representing the lawyers and the other the trust bankers, are set to the difficult tasks; first, of working out and, second, of promoting the enactment into law of what may serve the same purposes, even though not actually modelled after, the English Administration of Estates and Trustee Acts of 1925.

LIFE INSURANCE TRUST MOVEMENT

The 1930 figures of the amount of trusteed life insurance will not be available until after Jan. 1, 1931, but the figures up to 1930 show a phenomenal increase. Ten years ago the life insurance trust was unknown except in a few widely scattered trust company and life insurance company circles. In 1927, only $257,000,000 of life insurance was reported as having been trusteed. The next year this figure amounted to $700,000,000; and last year, to $1,200,000,000. It is not unlikely that 1930 will witness a total of $1,500,000,000 or $2,000,000,000 life insurance trusteed during the year, making a grand total of between $3,000,000,000 and $4,000,000,000 of trusteed life insurance. The most noteworthy development has not been in the trusteeing of life insurance for family purposes but in that taken for business purposes. Men have quickly recognized the value of a local trustee, clothed with wide discretionary powers, in administering funds for the benefit of dependents. But only recently—during 1930 far more than ever before—have they realized the need of an impartial, even-handed trustee to administer the proceeds of life insurance taken for business purposes. Business men and business organizations, partners and stockholders, firms and corporations, are taking life insurance—some for the benefit of the individual partners or stockholders, others for the benefit of the business—and having it made payable to a trustee and instructing the trustee what to do with the proceeds, principally either to purchase the deceased partner's or stockholder's interest or to pay the debts of the business or to provide working capital or to overcome the financial shock of the death of a key-man.

THE FEDERAL RESERVE SYSTEM

By E. A. Goldenweiser

Federal Reserve Board, Washington

LOANS AND DEPOSITS

Slack Demand for Commercial Loans.—Demand for credit to finance trade and industry was relatively small in 1930, owing to the inactive condition of business, and the banks of the country found that the demand for credit declined during the year. Reflecting this situation "all other loans," chiefly commercial, of reporting member banks decreased by more than $1,000,000,000 during the twelve months ended with November. On the other hand, the banks used surplus funds in buying investments and open market loans in the form of commercial paper and acceptances and in increasing their loans on the Stock

Exchange. The increase in bank loans on the Stock Exchange represented a taking over by banks in New York City of a small part of the loans made last year for account of non-banking lenders, which withdrew a great part of their funds after the break in the stock market and the drop in open market rates for money.

Growth of Deposits.—While loans and investments of reporting members increased by less than $30,000,000 during the year, time deposits increased about $725,000,000, while demand deposits showed little change. A development of this sort often accompanies business recessions and in this case was associated with net imports of gold as well as contraction in money in circulation, caused by reduced payrolls, a smaller volume of retail trade, and a lower level of commodity prices. In the accompanying table are shown changes over the year ended Nov. 26 in the principal assets and liabilities of member banks in leading cities which report weekly to the Federal Reserve Board and have about 60 per cent of the total loans and investments of all banks belonging to the Federal Reserve system:

PRINCIPAL ASSETS AND LIABILITIES OF REPORTING MEMBER BANKS

(Millions of dollars)

	Nov. 27, 1929	Nov. 26, 1930	Change
Loans and investments, total	23,353	23,381	+ 28
Loans on securities	7,889	7,761	— 128
All other loans...	9,809	8,766	—1,043
Investments	5,655	6,854	+1,199
Net demand deposits	13,890	13,882	— 8
Time deposits	6,760	7,487	+ 727
Borrowings from Federal Reserve Banks	603	84	— 519

BORROWINGS OF MEMBER BANKS

Decrease in Indebtedness.—The easy position of the member banks was further reflected in their ability to pay off indebtedness at the reserve banks whose discounted bills dropped from about $930,000,000 to $250,000,000 over the period of twelve months. This low level, indeed, prevailed throughout the final three-quarters of the year and represented a figure below any experienced since 1924. The decrease in indebtedness of member banks was due in part to the decreased demand for funds and in part to purchases of Government securities by the reserve banks in pursuance of a policy of monetary ease. Reserve bank holdings of acceptances were also smaller than a year earlier, partly because of the smaller volume of acceptances drawn, and partly because of the demand for bills by the member banks. Total bills and securities of the reserve banks at the end of November were about $1,000,000,000 as contrasted with $1,500,000,000 a year before, the principal factors contributing to the lessened demand for reserve bank credit being a net increase in the country's gold stock of about $200,000,000 and a decrease of $280,000,000 in money in circulation over the period. As a consequence of the diminished demand for currency in the autumn the banks were able to meet the seasonal requirements for credit and currency without a considerable increase in the use of reserve bank credit.

CHANGES IN RESERVE BANK CREDIT AND RELATED ITEMS

(Weekly averages of daily figures: in millions of dollars)

	Nov. 30, 1929	Nov. 29, 1930	Change
Bills discounted	933	246	—687
Bills bought	259	172	— 87
United States securities	326	597	+271
Other reserve bank credit	45	22	— 23
Total reserve bank credit	1,563	1,037	—526
Monetary gold stock	4,368	4,567	+199
Treasury currency adjusted	1,772	1,787	+ 15
Money in circulation	4,860	4,580	—280
Member bank reserve balances	2,421	2,403	— 18
Unexpended capital funds, non-member deposits, etc.	422	408	— 14

MONEY RATES

The relation of Federal reserve policy to the easy money conditions was expressed not only by a net increase in its portfolio of U. S. Government securities at a time when other factors were also making for ease, but by a reduction in discount rates as well. At the New York bank this rate, which had been advanced to 6 per cent in August, 1929, and had been reduced to 4½ per cent before the end of the year, was further reduced to 2½ per cent by the middle of 1930 and remained at that level, the lowest in the history of the system. The rates of the other banks, beginning the year 1930 at 4½ and 5 per cent, were at 3½ per cent by December, except that of Boston, which had been reduced to 3 per cent. The buying rate on acceptances of the shorter maturities at the Federal Reserve Bank of New York dropped during the period from 4 to 1⅞ per cent, and the movement of other rates in the money market was similar, the commercial paper rate decreasing from 5½ to 3 per cent, while the average of daily renewal call loan rates in New York for November of this year was around 2 per cent as contrasted with more than 10 and 12 per cent during the high period of 1929. A weighted average of rates charged customers by banks in leading cities throughout the country decreased to 4¾ per cent as contrasted with the high point of 6¼ per cent in 1929.

BROKERS' LOANS

The twelve months ended with November witnessed a further large reduction—from $3,400,000,000 to $2,100,000,000—in loans to brokers and dealers by member banks in New York City as the accompanying tabulation shows. Although these loans increased rapidly for a time in the spring of 1930, they were smaller for some weeks during the end of the period than at any time since the publication of this series of figures began in January, 1926, contrasting with the peak of $6,800,000,000 reached in October of the previous year. The year's reduction of $1,300,000,000 in these loans was associated with the shifting of securities from margin accounts to other forms of holdings including outright investment. Non-banking lenders, finding the prevailing low level of call loan rates unattractive, put to other uses $1,500,000,000 of their funds which had been in brokers' loans a year before, and at the same time out-of-town banks withdrew $250,000,000 from the security market. These gross withdrawals, however, did not all represent liquidation since the New York City banks increased their holdings by $450,000,000 during the period, increases by these banks being characteristic of times when other lenders withdraw funds more rapidly than liquidation progresses.

BROKERS' LOANS PLACED BY REPORTING MEMBER BANKS IN NEW YORK CITY

(In millions of dollars)

	Jan. 6 1926	Oct. 2 1929	Nov. 27 1929	Apr. 30 1930	Nov. 26 1930
For own account	1,338	1,071	831	1,695	1,288
For account of out-of-town banks	1,239	1,826	638	1,183	380
For account of others	564	3,907	1,982	1,397	455
Total	3,141	6,804	3,450	4,274	2,122

GOLD MOVEMENTS

Gold Stocks.—During the year ended Oct. 31, 1930, the gold stock of the United States increased by $150,000,000, of which $124,000,000 represented net imports from abroad, the difference being accounted for by domestic production and a change in gold earmarked for foreign account. The total stock of monetary gold in the United States at the end of the period amounted to $4,535,000,000, which was more than $100,000,000 below the peak figure of May, 1927.

Gold Exports and Imports.—Toward the end of October, 1929, the fall in security prices and the accompanying rapid decline in money rates was reflected in an outward movement of gold, particularly to France and England, and a decrease of $100,000,000 in the monetary gold stock of the United States occurred during the last two months of the year. From January through June, 1930, there were imports of gold amounting to $220,000,000, largely from Japan, China, Brazil, and other South American countries. The Japanese loss followed upon the return of the country to the gold standard, when restrictions on movements were removed, and upon a diminution of Japanese sales of silk to the United States and of cotton goods to China and India. Central and South American loss of gold was caused by a decline both in the volume and in the prices of raw materials exported by those countries following upon a long period of conditions in the United States unfavorable for the flotation of foreign bonds. During the five months beginning in July gold continued to flow into the United States from the Orient and South America, but in July and August this movement was more than offset by exports to France and Canada, while in September, October, and November there were once more considerable net imports to this country.

CENTRAL GOLD HOLDINGS[1]

(End of year figures. Millions of dollars)

	1926	1927	1928	1929	1930[2]
United States[3]	4,083	3,977	3,746	3,900	4,184
Argentina	451	529	607	434	428[5]
Australia	107	105	108	89	79
Belgium	86	100	126	163	180
Brazil	56	101	149	150	43[5]
Canada	158	152	114	78	122[5]
England	735	742	750	711	782
France	711	954	1,254	1,633	1,992
Germany	436	444	650	544	519
India	109	119	124	128	128
Italy	221	239	266	273	278[5]
Japan	562	542	541	542	414
Netherlands	166	161	175	180	171
Russia	85	97	92	147	249
Spain	493	502	494	495	478
Switzerland	91	100	103	115	128
Other countries	642	686	714	714	689[5]
Total[4]	9,193	9,551	10,012	10,297	10,865[5]

[1] For the 16 countries here shown separately—all of which have held gold in recent years to the amount of $90,000,000 or more—the figures are for central banks only, except as follows: *United States*—Treasury and Federal reserve banks; *Argentina*—Government conversion fund and Bank of the Nation; *Brazil*—Bank of Brazil and Government stablization fund; *Canada*—Government reserve against Dominion notes and saving-bank deposits, and gold deposits of chartered banks in the central reserve; *India*—currency and gold standard reserves of Government; *Japan*—domestic holdings of Bank of Japan and Government.

[2] October 31, 1930.

[3] The total monetary gold stock of the United States including gold coin in circulation was at the end of the month of December, 1926, $4,492,000,000; December, 1927, $4,379,000,000; December, 1928, $4,141,000,000; December, 1929, $4,284,000,000; October, 1929, $4,386,000,000; October, 1930, $4,535,000,000.

[4] 44 countries for 1926–28; 45 countries for 1929–30.

[5] Preliminary.

BRANCH, GROUP, AND CHAIN BANKING

The attention of the Federal reserve system as well as the banking community in general became particularly engaged during the year with the problems related to the changing forms of banking organization in the United States. Statistics compiled over a period of years by the Federal Reserve Board indicate that during the previous year, 1929, the movement toward conducting the business of one banking organization from many offices as contrasted to the one-office bank which has been traditional in this country gained momentum. The growth in multi-office banking activities resulted in part from new branch offices, the increase of which among members of the Federal reserve system had been encouraged by the liberalized provisions in this respect of the McFadden Act of February, 1927, but in addition, multi-office institutions were particularly increased by the formation, especially during 1929, of large holding companies, commonly called groups, controlling banks located in scores of cities.

Figures compiled by the Board show that of the 24,630 banks of all classes in the country on Dec. 31, 1929, 822 were operating 3,547 branch offices, and somewhat more than 2,000 banks, including some of the branch systems, belonged to groups or chains. At this time there were 28,177 banking offices in the United States, nearly a quarter of which were parts of multi-office systems, and these were extending half of the total banking credit of the country, although a considerable portion of this banking power, it should be observed, was represented by large metropolitan banks, whose multiple office activities are limited to the head office city. In view of the continuous growth in banking concentration, and also in view of the large number of bank failures, the Federal reserve system undertook early in 1930 to make a thorough survey of the entire banking situation.

BANKING INVESTIGATIONS BY CONGRESS

In the House.—The Committee on Banking and Currency of the House of Representatives began Feb. 25, 1930, a series of hearings under a resolution of authorization "to make a study and investigate group, chain, and branch banking during the present session of Congress. The Committee shall report to the House the results of its investigation, including such recommendations for legislation as it deems advisable." The Comptroller of the Currency, the Governor of the Federal Reserve Board, and many of the most prominent bankers of the country, associated not alone with the branch or group movements, but representing as well the points of view of the unit bankers, appeared before the House Committee, submitting their ideas in fixed statements and in response to cross questioning. Sessions were held throughout the spring until Congress adjourned.

In the Senate.—The Banking and Currency Committee of the Senate was granted authority to survey the problem by a resolution adopted by the Senate, hearings under which are expected to begin with the session of Congress convening in December. Under the resolution as passed the Committee has authority to cover in addition to the subject of branch and group banking a wide variety of matters touching the interests of the Federal reserve system as indicated by the following paragraph:

"That in order to provide for a more effective operation of the national and Federal reserve banking systems of the country the Committee on Banking and Currency of the Senate, or a duly authorized subcommittee thereof, be and is hereby empowered and directed to make a complete survey of the system and a full compilation of the essential facts and to report the results of its findings as soon as practicable, together with such recommendations for legislation as the committee deems advisable. The inquiry thus authorized and directed is to comprehend specifically the administration of these banking systems with respect to the use of their facilities for trading in and carrying speculative securities; the extent of call loans to brokers by member banks for such purposes; the effect on the systems of the formation of investment and security trusts; the desirability of chain banking; the development of branch banking as a part of the national system, together with any related problems which the committee may think it important to investigate."

AMENDMENTS TO THE FEDERAL RESERVE ACT

Rediscounts.—During the course of the year several pieces of legislation affecting the Federal reserve system were enacted by Congress. On April 12th the Federal Reserve Act was amended so as to make the limitations upon the rediscount by Federal reserve banks of the paper of one borrower conform more closely to the limitations on loans to one borrower by a national bank. Under the new law, a member bank may rediscount with a Federal reserve bank the same amount of paper of a single borrower as a national bank may acquire from a single borrower under the provisions of Section 5200 of the Revised Statutes. The new law does not in any way change the character or class of paper eligible for rediscount.

Membership Withdrawal. — The Federal Reserve Act was amended April 17 so as to authorize the Federal Reserve Board in its discretion to permit state member banks of the Federal reserve system to withdraw from membership without waiting six months after filing notice of intention to withdraw, as heretofore required by law.

Bank Liquidation.—An act of April 23 provides for facilitating the cancellation of Federal reserve bank stock held by a member bank which has discontinued its banking operations without a receiver or liquidating agent having been appointed. It is provided that if a national bank which has not gone into liquidation and for which a receiver has not already been appointed for other cause shall discontinue its banking operations for a period of 60 days, the Comptroller of the Currency may, if he deems it advisable, appoint a receiver for such bank and the Federal reserve bank stock held by it may thereupon be cancelled. It is also provided that if a state member bank ceases to exercise banking functions without a receiver or liquidating agent having been appointed therefor the Federal Reserve Board may, after hearing, forfeit the membership of such bank in the Federal reserve system.

Miscellaneous. — Amendments to Federal Reserve Act, approved June 26, clarified an ambiguity in the law concerning the election of directors of the Federal reserve banks; authorized national banks under certain circumstances to surrender their right to exercise trust powers; made alterations in the seventh paragraph of Section 9 with reference to the assessment of costs of examinations against member banks of the Federal reserve system.

FEDERAL RESERVE BANK MEMBERSHIP

During the year ended June 30, 1930, 122 banks joined the Federal reserve system and 213 withdrew from membership, including banks that withdrew as a result of conversion or absorption of member by nonmember banks. Mergers between member banks, suspensions and liquidations resulted in a net loss of 301 banks, so that total membership in the system showed a decline of 392 for the year, of which 283 were national and 109 state institutions. At the end of June, 1930, 8,315 banks or approximately 35 per cent of all the banks in the country belonged to the system and these banks had loans and investments totaling $35,650,000, or over 60 per cent of the loans and investments of all banks, about the same proportion as that of a year previously. The member banks comprised 7,247 national banks with loans and investments of $22,000,000,000 and 1,068 state banks with loans and investments of $14,000,000,000.

PERSONNEL

Roy A. Young resigned as Governor of the Federal Reserve Board at the end of August to become Governor of the Federal Reserve Bank of Boston, to succeed W. P. G. Harding, who died April 7. On Sept. 16, Eugene Meyer was appointed a member of the Federal Reserve Board to fill the vacancy created by the resignation of Vice-Governor Edmund Platt Sept. 15 and was designated as Governor of the Board. Edward H. Cunningham, member of the Board, died Nov. 28.

Gates W. McGarrah, Federal Reserve Agent at New York, tendered his resignation effective Feb. 27 and J. H. Case was designated by the Federal Reserve Board as his successor. On May 9 John S. Wood was appointed Federal Reserve Agent at St. Louis, in place of Rolla Wells, resigned. William A. Heath resigned as Federal Reserve Agent at Chicago effective Dec. 31, 1930, and Eugene M. Stevens was appointed to succeed him.

Herbert K. Hallett was appointed to represent the Boston district on the Federal Advisory Council in place of Arthur M. Heard, George H. Prince to represent the Minneapolis district in place of Theodore Wold and Walter S. McLucas to represent the Kansas City district in place of W. P. Goebel. Melvin A. Traylor succeeded Frank O. Wetmore, deceased, as representative of the Chicago district and Howard A. Loeb succeeded Levi L. Rue, resigned, as representative of the Philadelphia district. B. A. McKinney of the Dallas district, former Vice-President of the Council, was elected President to fill the vacancy caused by the death of Frank O. Wetmore.

BANKS AND TRUST COMPANIES

By Gurden Edwards

Secretary, Economic Policy Commission, American Bankers Association

NATIONAL BANKS

Aggregate resources of all National banks in the United States rose between June 30, 1929 and June 30, 1930 from $27,440,000,000 to $29,120,000,000, or by $1,680,000,000, while their numbers decreased from 7,536 to 7,252, which was a loss of 284. The year before, ended June 30, 1929, the aggregate resources of the National banks showed a decrease of $1,070,000,000.

RESOURCES AND LIABILITIES OF NATIONAL BANKS

June 30, 1930, compared with June 30, 1929
(In thousands of dollars)

	June 30, 1929	*June 30, 1930*
Number of banks	7,536	7,252
Resources		
Loans and discounts (including rediscounts)	$14,801,130	$14,887,752
Overdrafts	10,193	9,452
Investments	6,656,535	6,888,171
Banking house, furniture and fixtures	747,684	787,750
Real estate owned other than banking house	118,839	124,584
Cash in vault	298,003	342,507
Reserve with Federal reserve banks or other reserve agents	1,344,951	1,421,676
Other amounts due from banks	1,854,187	2,353,669
Exchanges for clearing house and other cash items	785,006	1,294,487
Other resources	823,700	1,003,491
Total resources	$27,440,228	$29,116,539
Liabilities		
Capital stock paid in	$ 1,627,375	$ 1,743,974
Surplus	1,479,052	1,591,339
Undivided profits—net	487,504	545,873
Reserves for dividends, contingencies, etc.	80,832	94,962
Reserves for interest, taxes, and other expenses accrued and unpaid	73,968	79,129
National-bank circulation	649,452	652,339
Due to banks	2,175,932	3,418,148
Demand deposits	10,876,818	10,926,201
Time deposits (including postal savings)	8,317,095	8,752,571
United States deposits	228,243	171,964
Total deposits	21,598,088	23,268,884
Bills payable and rediscounts	714,507	229,033
Agreements to repurchase securities sold	49,660	8,173
Acceptances	392,623	770,651
Other liabilities	287,167	132,182
Total liabilities	$27,440,228	$29,116,539

Assets and Liabilities.—These data show increases of $86,622,000 in loans and discounts and $231,636,000 in investments on the asset side; and of $116,599,000 in capital, $170,656,000 in surplus and undivided profits, $421,933,000 in demand deposits, $435,476,000 in time deposits and of $1,670,796,000 in all deposit items on the liability side.

Branch banking increased slightly in the national bank system during the year; October 31, 1929 there were 1,061 branches officially reported. while on October 31, 1930 there were 1,086, an increase of 25.

Banking Trusts.—The rapid growth of trust banking in the United States among other than trust companies was evidenced by the facts that 2,472 national banks, or 34 per cent of the total number, held authority to exercise trust powers on June 30, 1930 and that 1,829 were exercising these powers through established trust departments, administering 79,912 individual trusts with assets aggregating $4,473,000,000 and 11,511 corporate trusts, and were acting as trustee for outstanding note and bond issues amounting to $11,804,000,000. These figures represent an increase in the year of 95 national banks administering trusts, with an advance of 15,435, or 20 per cent, in the number of trusts being administered and of $235,392,000, or 5½ per cent in the volume of individual trust assets, while the volume of trusteeships under bond issues increased $4,433,000,000, or 60 per cent.

Earnings and Dividends.—The national banks declared dividends during the year ended June 30, 1930 of $237,000,000, their gross earnings amounted to $1,427,300,000, net earnings $428,300,000 and net additions to profits $246,300,000.

Bank Technology.—The National Bank Division of the American Bankers Association, the nationwide voluntary association of this type of bank, contributed important results during the year to the field of bank technology through its committees on investments, research and special departments and watched the interests of banking and the public in the fields of state and national legislation affecting national banks.

STATE BANKS

Number and Resources.—State Commercial banks, 13,582 in number, reported aggregate assets on June 30, 1930 at $15,270,000,000, a decrease in a year of $1,554,000,000, while the total number of these banks fell off by 855. Detailed figures for the mid-year condition of this class of banks follow:

RESOURCES AND LIABILITIES OF STATE (COMMERCIAL) BANKS

June 30, 1930, compared with June 30, 1929
(In thousands of dollars)

	June 30, 1929	*June 30, 1930*
Number of banks	14,437	13,582
Resources		
Loans and discounts (including rediscounts)	$10,361,723	$9,216,468
Overdrafts	38,016	33,918
Investments	3,084,672	2,947,712
Banking house, furniture and fixtures	464,469	436,235
Real estate owned other than banking house	152,629	145,012
Cash in vault	313,997	294,852
Reserve with Federal reserve banks or other reserve agents	866,173	848,129
Other amounts due from banks	903,315	817,049
Exchanges for clearing house and other cash items	298,859	188,341
Other resources	340,462	342,186
Total resources	$16,824,315	$15,269,902

RESOURCES AND LIABILITIES OF STATE (COMMERCIAL) BANKS

June 30, 1930, compared with June, 30, 1929

(In thousands of dollars)

(*Continued*)

	June 30, 1929	*June 30, 1930*
Liabilities		
Capital stock paid in	$ 1,155,878	$ 1,080,960
Surplus	804,400	746,812
Undivided profits—net	237,422	239,420
Reserves for dividends, contingencies, etc	56,054	86,802
Reserves for interest. taxes, and other expenses accrued and unpaid	41,554	26,278
Due to banks	649,980	647,985
Certified and cashiers' checks and cash letters of credit and travelers' checks outstanding	113,219	104,715
Demand deposits	6,515,263	5,636,021
Time deposits (including postal savings)	6,298,456	5,953,921
United States deposits	7.310	4,269
Deposits not classified	2,742	38,881
Total deposits	13,586,970	12,385,792
Bills payable and rediscounts	454.842	249,083
Agreements to repurchase securities sold	3.148	37,594
Acceptances executed for customers	44,279	66,312
Other liabilities	439,768	350,849
Total liabilities	$16,824,315	$15,269,902

Assets and Liabilities.—These data show decreases of $1,145,255,000 in loans and discounts and of $136,960,000 in investments. Capital also dropped by $74,918,000, surplus by $57,588,000 and total deposits by $1,201,178,000.

State Bank Savings and Trusts.—As in the case of the national banks, there was a wide growth of savings and trust departmental activities among the state commercial banks. Growth of trust departments in these institutions reflected the strengthening popular demand for complete banking services from a bank, including the handling of business and personal checking deposits, savings funds, investments and post-mortem financial management.

Banking Status.—The State Bank Division of the American Bankers Association, the dominant national organization of commercial state chartered banks, comprising a majority of banks of this class, continued active during the year in promoting better banking practices and methods, better state bank supervision conditions, organization of city, county and regional clearing house associations to foster a greater degree of coöperation for the common good among locally competing banks, and in a number of other directions aiming at improved banking both for the welfare of the banks and the public.

TRUST COMPANIES

Number and Resources.—Trust companies in the United States on June 30, 1930 numbered 1,564, or 44 less than on the corresponding date of the year before, but they showed an increase in resources, which stood at $17,703,000,000, constituting a growth of $1,548,000,000 in the year.

RESOURCES AND LIABILITIES OF LOAN AND TRUST COMPANIES

June 30, 1930, compared with June 30, 1929
(In thousands of dollars)

	June 30, 1929	*June 30, 1930*
Number of trust companies	1,608	1,564
Resources		
Loans and discounts (including rediscounts)	$ 9,311,879	$ 9,475,936
Overdrafts	7,585	5,585
Investments	3,421,673	3,835,746
Banking house, furniture and fixtures	385,112	428,889
Real estate owned other than banking house	68,221	83,188
Cash in vault	156,580	176,126
Reserve with Federal reserve banks or other reserve agents	923,415	1,045,843
Other amounts due from banks	553,577	531,883
Exchanges for clearing house and other cash items	594,823	1,392,996
Other resources	732,310	726,468
Total resources	$16,155,175	$17,702,660
Liabilities		
Capital stock paid in	$ 941,333	$ 995,555
Surplus	1,454,504	1,684,184
Undivided profits—net	208,632	200,102
Reserves for dividends, contingencies, etc.	9,958	69,202
Reserves for interest, taxes, and other expenses accrued and unpaid	24,394	16,141
Due to banks	792,134	1,001,867
Certified and cashiers' checks and cash letters of credit and travelers' checks outstanding	350,881	771,207
Demand deposits	6,956,032	7,363,000
Time deposits (including postal savings)	3,939,532	4,248,970
United States deposits	44,134	34,677
Deposits not classified	13,985	76,929
Total deposits	12,146,698	13,496,650
Bills payable and rediscounts	437,992	172,500
Agreements to repurchase securities sold	2,669	1,910
Acceptances executed for customers	12,942	8,628
Other liabilities	916,053	1,057,788
Total liabilities	$16,155,175	$17,702,660

Comparisons.—These figures show that the trust companies increased their loans and discounts by $164,057,000 during the year, while their investments rose by $414,073,000. Their capital expanded by $54,222,000, and surplus by $229,680,000, while total deposits were up by $1,349,952,000.

Trust Company Division, A. B. A.—The chief national unifying factor among the trust companies of the United States, the Trust Company Division, American Bankers Association, reached its thirty-fourth year of activity in 1930. When it was organized there were only 242 trust companies with resources of but $807,000,000. The division represents the trust companies in a national way in many capacities, such as in respect to both Federal and state legislation affecting their business and that of their clients and in regard to taxation bearing on banking resources, estates, trusteed funds and other property entrusted to their care. During the year the Trust Company Division held four regional conferences for the discussion of trust business, technique and administration, at which more than half the trust officers of the country were represented.

SAVINGS BANKS

Stock Savings Banks.—There were 1,320 savings banking institutions in the United States June 30, 1930, a decrease of 38. Of these savings institutions 714 were stock savings banks with total resources of $1,520,000,000 and with capital surplus and undivided profits of $114,322,000. These figures represent a loss in numbers of 33 for this class of bank, with a decrease of $68,736,000 in point of total resources and $2,302,000 in capital funds as compared with the corresponding date for 1929. These reductions were in line with the trend of recent years in this class of banking institutions which are suffering from the competition of other classes of organizations and banks now conducting savings activities and departments and attracting time deposits. Deposits declined in the stock savings banks in the year by $65,089,000.

RESOURCES AND LIABILITIES OF STOCK SAVINGS BANKS

June 30, 1930, compared with June 30, 1929
(In thousands of dollars)

	June 30, 1929	*June 30, 1930*
Number of banks	747	714
Resources		
Loans and discounts (including rediscounts)	$1,006,325	$919,318
Overdrafts	230	187
Investments	382,262	378,933
Banking house, furniture and fixtures	43,502	41,105
Real estate owned other than banking house	21,270	21,799
Cash in vault	17,345	16,018
Reserve with Federal reserve banks or other reserve agents	16,888	89,247
Other amounts due from banks	93,960	46,925
Exchanges for clearing house and other cash items	6,060	3,513
Other resources	2,003	4,064
Total resources	$1,589,845	$1,521,109
Liabilities		
Capital stock paid in	$ 62,487	$ 60,336
Surplus	40,513	40,666
Undivided profits—net	13,624	13,320
Reserves for dividends, contingencies, etc.	1,062	2,086
Reserves for interest, taxes, and other expenses accrued and unpaid	1,570	521
Due to banks	8,107	6,308
Certified and cashiers' checks and cash letters of credit and travelers' checks outstanding	372	640
Demand deposits	219,770	128,304
Time deposits (including postal savings)	1,230,228	1,260,852
United States deposits	5,381	2,812
Deposits not classified	165	18
Total deposits	1,464,023	1,398,934
Bills payable and rediscounts	5,336	4,045
Acceptances executed for customer	54	
Other liabilities	1,176	1,201
Total liabilities	$1,589,845	$1,521,109

Mutual savings banks fared better during the year. There were 606 institutions of this class on June 30, 1930, with aggregate resources of $10,295,308,000. These figures represented a loss as to numbers of only 5 in the year and an increase in resources of $288,856,000. The aggregate surplus was $898,871,000, an increase of $75,178,000 and undivided profits stood at $154,623,000, an increase of $6,898,000. A rise in deposits of $212,542,000 was recorded, this item standing on June 30 at $9,215,888,000.

RESOURCES AND LIABILITIES OF MUTUAL SAVINGS BANKS

June 30, 1930, compared with June 30, 1929
(In thousands of dollars)

	June 30, 1929	*June 30, 1930*
Number of banks	611	606
Resources		
Loans and discounts (including rediscounts)	$ 5,801,489	$ 5,896,025
Investments	3,775,770	3,872,417
Banking house, furniture and fixtures	110,269	113,162
Real estate owned other than banking house	23,059	44,243
Cash in vault	31,495	39,404
Reserve with Federal reserve banks or other reserve agents	35,986	25,856
Other amounts due from banks	150,137	234,713
Exchanges for clearing house and other cash items	5,946	1,779
Other resources	72,301	72,709
Total resources	$10,006,452	$10,295,308
Liabilities		
Surplus	$ 823,693	$ 898,871
Undivided profits—net	147,725	154,623
Reserves for dividends, contingencies, etc.	13,527	15,157
Reserves for interest, taxes, and other expenses accrued and unpaid	1,229	638
Due to banks	182	173
Certified and cashiers' checks and cash letters of credit and travelers' checks outstanding	46	152
Demand deposits	98,473	10,305
Time deposits	8,903,126	9,205,258
Deposits not classified	1,519	
Total deposits	9,003,346	9,215,888
Bills payable and rediscounts	1,366	673
Other liabilities	15,566	9,458
Total liabilities	$10,006,452	$10,295,308

Savings Deposits.—While the foregoing figures cover the specifically designated savings banking institutions savings banking activities, however, in the United States are not wholly comprised within such institutions. To find the full facts regarding savings deposits in banks it is necessary to go to the figures for all classes of banks as has been done by the Savings Bank Division of the American Bankers Association. The figures compiled by the association show that total savings in banks in the United States on June 30, 1930 aggregated $28,485,000,000, an increase of $267,000,000 since the corresponding date of a year earlier and constituting the highest point in these figures ever recorded in the twenty years they have been annually compiled. The per capita savings by the 1930 census was $232. The following tables give a statistical picture of the savings banking situation in the United States in 1930 as compared with the immediately preceding years.

SAVINGS DEPOSITS IN CLASSIFIED BANKS

(In thousands of dollars)

Year	*Mutual Savings Banks*	*State Banks*	*Trust Companies*	*Private Banks*	*National Banks*
1927	$8,039,784	$7,382,147	$3,530,954	$49,725	$7,088,297
1928	8,668,090	7,597,977	4,080,324	16,797	8,049,773
1929	8,903,557	7,412,561	4,022,735	33,285	7,889,352
1930	9,205,580	6,810,033	4,349,057	23,546	8,096,776

TOTAL DEPOSITS AND DEPOSITORS IN ALL BANKS

Year	*Total Savings Deposits*	*Total Number Savings Depositors*
1927	$26,090,902,000	48,354,784
1928	28,412,961,000	53,188,348
1929	28,217,656,000	52,815,903
1930	28,484,992,000	52,789,175

School Savings Banking.—Another important phase of savings is school savings banking, developed under the leadership of the American Bankers Association's Savings Bank Division on a plan by which education in thrift is carried on along with school hours on a wide scale throughout the country.

SCHOOL SAVINGS IN THE UNITED STATES

Year	*Number of Schools*	*Number Participating*	*Deposits*	*Net Savings*
1926-27..................	12,678	3,742,551	$23,703,436	$ 9,464,178
1927-28..................	13,835	3,980,237	26,005,138	9,476,391
1928-29..................	14,254	4,222,935	28,672,496	10,539,928
1929-30..................	14,610	4,597,731	29,113,063	7,690,529

PRIVATE BANKS

The private banks reporting to the public banking authorities in the United States during 1930 numbered 361 institutions, a drop of 30 units in this class. Their aggregate resources were $114,606,000 on June 30, 1930, a drop of $41,884,000 in the year. The private banks' total capital funds were $17,187,000, a decrease of $4,733,000. Their total deposits were $81,047,000 which was $30,469,000 below the figure for the year previous.

RESOURCES AND LIABILITIES OF ALL REPORTING BANKS

June 30, 1929, compared with June 30, 1930
(In thousands of dollars)

	June 30, 1929	*June 30, 1930*	*Increase*	*Decrease*
Number of banks.........................	25,330	24,079	....	1,251
Resources				
Loans and discounts (including rediscounts)	$41,376,269	$40,460,670	....	$915,599
Overdrafts	56,847	49,438	....	7,419
Investments	17,348,738	17,944,728	595,990	....
Banking house, furniture and fixtures.....	1,754,454	1,810,357	55,903	....
Real estate owned other than banking house	390,816	425,151	34,335	....
Cash in vault..........................	819,928	865,970	46,042	....
Reserve with Federal reserve banks or other reserve agents	3,192,200	3,433,102	240,902	....
Other amounts due from banks............	3,567,525	3,994,325	426,800	....
Exchanges for clearing house and other cash items	1,691,772	2,884,635	1,192,863	....
Other resources	1,973,946	2,151,748	177,802	......
Total resources	$72,172,505	$74,020,124	$1,847,619	....
Liabilities				
Capital stock paid in......................	$ 3,796,978	$ 3,889,419	$ 92,441	....
Surplus	4,611,698	4,968,999	357,301	....
Undivided profits—net	1,097,386	1,154,804	57,418	....
Reserves for dividends, contingencies, etc...	161,483	268,276	106,793	....
Reserves for interest, taxes, and other expenses accrued and unpaid............	142,776	122,737	....	20,039
National bank circulation.................	649,452	652,339	2,887	....
Due to banks...........................	3,629,197	4,337,120	707,923	....
Certified and cashiers' checks and cash letters of credit and travelers' checks outstanding	837,430	1,615,277	777,847	....
Demand deposits	24,350,164	24,098,516	....	251,648
Time deposits (including postal savings)....	28,787,617	29,465,361	667,744	....
United States deposits	286,112	213,722	....	72,390
Deposits not classified	20,121	117,199	97,078	....
Total deposits	57,910,641	59,847,195	1,936,554	....
Bills payable and rediscounts...............	1,630,703	665,817	....	964,886
Agreements to repurchase securities sold....	55,523	47,678	....	7,845
Acceptances executed for customers........	449,917	585,969	136,052	....
Other liabilities	1,665,948	1,816,891	150,943	....
Total liabilities	$72,172,505	$74,020,124	$1,847,619	....

FOREIGN EXCHANGE

By Ray Hall

Senior Economic Analyst, Department of Commerce

The year 1930 opened with the whole world sliding swiftly into a depression unequalled since 1921. At such a time, foreign exchange becomes a barometer of world conditions. Abnormal exchange developments in individual countries were usually but local symptoms of the universal distress.

INTERNATIONAL LENDING

The world crisis of overproduction of raw materials, such as wheat, rubber, coffee, copper, tin, sugar and silver, had, as usual, monetary and credit phases. The principal international lender the United States, exported about $561,000,000 (net) less capital in 1929 than in 1928, a powerful deflationary influence in the capital-importing nations. British net capital exports to those nations likewise declined notably in 1929; and the export of American and British capital was about as low in 1930 as in 1929. In both years there were enormous flows of gold into the United States and France, as a direct result of reduced international lending; in 1929 alone, those two nations "sterilized gold to the value of $110,000,000," or nearly 6 per cent of the world's gold stock, according to Sir Henry Strakosh. The world price decline resulted largely from these credit and monetary phases of the world crisis; and the gold movements seriously strained the currencies of a number of countries, as did political disorders arising from unemployment during the world slump in business.

DOLLAR EXCHANGE

Gold Movement and Capital Exports.—In recent years American gold movements and the quotations of dollar exchange have resulted primarily from fluctuations in America's net exports of capital. That fact has been proved, despite the impossibility of finely measuring the "promotive and detractive relationships" between any two balance-of-payments items. Proof resides in the facts (1) that of the annual fluctuations in America's net gold shipments in seven recent years, no less than 84 per cent *could* have resulted from annual fluctuations in America's net capital exports and, oppositely, (2) that in those years 41 per cent of America's capital-export fluctuations seem to have been settled in gold.[1] During the first half of 1930 dollar exchange remained at such high premiums that America's net import of gold was $222,536,000, actually more than in the first half of 1929. The trade balance during the two periods having been but negligibly altered, and there having been no radical fluctuation in the miscellaneous invisible items, as a group, it was clear that the gold inflow resulted from continued light foreign lending. Investigation showed that short-term foreign financing by dollar acceptances had declined by about the same amount that long-term financing had risen. The $42,000,000 gold exports during July (to France and Canada) probably resulted from disequilibrium resulting from the transfer of (a) proceeds of the "commercialized reparations" bond issue of $98,250,000, brought out on June 12 and of (b) heavy awards by the United States Treasury to German shipping lines. Throughout August, dollar exchange was at a discount in terms of sterling marks, francs, and Canadian dollars; but the net outflow of gold was only about $20,000,000. The reversal of the gold movement in September (net imports $2,536,000) is statistically accounted for by (a) reduced underwriting of foreign bonds in the third quarter incident to sagging quotations on outstanding issues and by (b) a rise in America's favorable trade balance.

Proposed Pegging of Dollar Exchange.—During the year financial periodicals featured the novel proposal of stabilizing dollar exchange by Federal reserve bank operations in foreign exchange. Briefly, under Section 14 of the Federal Reserve Act, the reserve banks would buy foreign exchange whenever it was at a heavy discount and sell it whenever it was at a large premium. The aim would be not so much to gain the profits thus accruing, nor even to obtain the interest upon short-term investments abroad, as to stabilize the net export of American capital. Gold movements, so colossal in recent years, would be greatly reduced, thereby lessening the shocks to domestic credit created by those movements and obviating to that extent the need of "neutralizing" them by open-market sales or purchases of Government obligations. To some extent American export trade would be stabilized, and so would the cost to the foreign borrower of dollar acceptance credit. The proposal is rather too new to be regarded as of immediate practical consequence. In 1930 the principal foreign money-markets were flooded with short-term funds, incident to world-wide liquidation; and additional funds from this country might have been unwelcome. In lesser countries the currencies were, in many cases, under such grave strain as to discourage foreign commitments in them.

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[1] *American Bankers Association Journal* June, 1930, p 1111.

The Crossrate.—Sterling, in terms of dollars, remained almost consistently at a slight discount. Only in January and August did it average at a premium. There was, however, only a negligible gold movement between London and New York. Interest rates for bankers' dollar acceptances at New York were above those for sterling bills during February, March, April and May; and this might account for sterling weakness in these months. Money rates in both New York and London, however, were declining sharply and the uncertainty as to their ultimate settling levels may have been too great to permit any important movement of funds based on interest differentials alone. The July and August strength in sterling followed a stabilization of short-term money rates in both London and New York with the higher rates obtaining in London. Those who expect to find that the crossrate depends almost exclusively upon the interest differential between these two leading financial centers will be surprised to note that sterling fell back to a discount in the last quarter of the year despite the lower interest rates in New York.

PARITY OF CANADIAN EXCHANGE

The year opened with the Canadian dollar at a discount of more than 2 1/10 per cent. It did not actually reach parity until June 14; but it rose as high as 99.9991 on March 25 in a season when Canadian exchange is normally weak. For eighteen consecutive months ended with June, it averaged below par; although the monthly averages of Canadian exchange had never been below par for more than four consecutive months after the first post-war monthly average at par, in May, 1925. The low point in Canadian exchange for many years was established Oct. 30, 1929, when the discount was slightly more than 2½ per cent.

As it is profitable to ship gold from Canada to the United States when the Canadian dollar is at a discount of 1/5 per cent, or even less, Canada was considered to be definitely off the gold standard for about a year. The *Statist* (London) felt compelled to remove the Canadian dollar from its foreign-exchange index. The principal factors in the decline in Canadian exchange were: (1) Canadian speculation during the Wall Street boom of 1927-29; (b) heavy additional placements in brokers' loans at New York by the chartered banks—these high-yield investments serving incidentally as the principal item in the "cash reserves" of the chartered banks; and (c) the increasingly unfavorable trade balance of Canada, resulting partly from a heavy carryover by the Canadian Wheat Pool. Partially offsetting these factors, were (1) unusually heavy lending to Canada by American investors and (2) record-breaking expenditures by American tourists in Canada.

The proximate cause of the debacle was the "informal gold-export embargo," said to have been created by the Minister of Finance in coöperation with the chartered banks. About $185,000,000 (net) of gold was imported in the United States during the 32 months preceding the low point in Canadian exchange. This drain seriously depleted the gold reserves held by the Finance Department against note circulation.

The return of Canadian exchange to parity was aided by (1) heavy investing in Canada by Americans early in 1930, (2) the return of Canadian funds, including those of the chartered banks, after the stock market crash late in 1929, and (3) the resumption of exports by the Canadian Wheat Pool. The influence of the Hawley-Smoot Tariff Act of 1930, and of reprisal tariff regulation by Canada, upon Canadian exchange would be difficult to trace; but it is noted that Canada's unfavorable trade balance with the United States has been reduced radically in recent months. In any case, Canadian exchange averaged at par or about par throughout the second half of 1930; and there were heavy shipments of gold to Canada for the first time in about two years. An interesting item in the study of gold points was afforded by the export of nearly $12,000,000 of gold to Canada during July, although the maximum premium on Canadian exchange during that month was 0.1475 per cent. On April 15 the Federal reserve banks began to accept Canadian banknotes from member banks at a nominal collection charge. This arrangement is calculated to abolish the extortionate discounts on these banknotes sometimes charged to Canadian visitors to this country.

EUROPEAN EXCHANGES

Spain and Turkey.—Only Turkey, Portugal and Spain, among European countries, have failed to stabilize their currencies on at least a *de facto* basis. Stabilization was continuously discussed in Spain, whose central bank is very rich in gold reserves; but the peseta continued to fluctuate wildly, mostly downward to $0.0956 on Oct. 15 from a high of $0.1344 on Jan. 13. Turkey was advised in September not to attempt stabilization at present, in a report by Dr. Hjalmer Schact, whose services had been retained by the Government.

Germany.—The German mark was subjected to violent but temporary strain by a flight of German and foreign capital caused by Anti-Semitic riots and by the elections of Sept. 14, at which Communists and Fascists both gained heavily. German exchange was supported (1) by the $125,000,000 credit, for six months (but renewable), granted to the Reich in October by New York bankers; (2) by operations of the newly founded Bank of International Settlements; (3) by Reichsbank sales of foreign exchange; and (4) by heavy gold shipments out of Germany. The total of these four items roughly indicates the enormous sum involved in the flight of capital.

AUSTRALIAN EXCHANGE

The Australian pound went off the gold standard in December, 1929, when the Federal treasurer was empowered to embargo gold exports. In January, 1930, the Commonwealth arranged with the banks for the "nationalizing" and rationing of foreign exchange. On March 24, an "official" rate was established, with the Australian pound at a discount against sterling of 6½ per cent raised to 9 per cent in October. As usually occurs whenever official rates are set, a curb or "bootleg" market sprang up. Pressure on Australian exchange increased during the year, despite increased import duties and quantity quotas for the importation of specified commodities and despite huge Commonwealth overdrafts arranged with the Bank of England and the joint stock banks, estimated as high as £36,000,000 in August. Exporters to Australia often encountered serious obstacles and delays in transferring sums collected in the country. After borrowing regularly in an alarming volume for many years, Australia took drastic measures in 1929 to curtail state and municipal borrowing. The service of the heavy foreign indebtedness continued during the world depression, from which Australia suffered perhaps more than any other country. The world price decline hit few articles so hard or so suddenly as wool and wheat, staples comprising well over half of Australian exports.

LATIN-AMERICAN EXCHANGES

The overproduction behind the depression of 1929-30 was to an unparallelel degree overproduction of raw materials, and Latin America exports little else. During 1929 there were declines of from 30 to 50 per cent in the world price levels of practically every staple export of Latin America: coffee, wheat, cotton, sugar, copper, nitrates, silver, tin, hides, etc. The principal importations of the region on the other hand, are manufactured articles, which were less affected by the world price decline. The transfer problems of the various nations were further complicated by the sharp curtailment of capital imports, as well as by political disorders in several of the nations. The strain was felt by practically all Latin-American countries. Argentina went off the gold standard late in 1929, carrying the Paraguayan peso with it. Rigorous exchange restrictions were enacted in Peru, Brazil, Salvador, Honduras and Mexico. The prospect of speedy rehabilitation of the several Latin-American exchanges is none too bright. It has often been declared that agricultural nations are slow in recovering from business depressions, in part because they are usually capital-importing nations. The quotations of Latin-American bonds are so low that borrowings can hardly be expected to reach the volume of 1927 and 1928 for some time to come. Moreover, in agriculture, adjustments to new scales of production at new price levels are especially difficult to make.

JAPANESE EXCHANGE

After being off the gold standard for twelve years, Japan lifted its embargo on gold exports Jan. 11. The Government had given a two months' notice of the measure and had arranged a 100,000,000 yen contingent credit, half in New York and half in London. The credit expired Nov. 11, without being drawn upon, and was not renewed. The yen did not actually reach par; but it was held close enough to par by heavy gold exports to the United States ($122,000,000 during the first eight months.) The strain on Japanese gold reserves would be relieved by higher silk prices, by an improvement in the cotton goods markets of China and India, or by a resumption of Japanese borrowing from abroad.

SOVIET EXCHANGE

The Soviet State Bank exercises a legal monopoly over Russian exchange transactions; so from the foreign viewpoint there is, strictly speaking, no Russian exchange. The equation of Soviet international payments met with immense difficulties during the world depression of 1930. In partially paying for its increasing imports of goods and services, the Soviet organization was forced to dump into foreign markets lumber, wheat, coal and other commodities at prices involving enormous sacrifice to the Russian community; and unknown sums of gold, from production or reserves, were squeezed out of the country. Imports of raw cotton were reduced by shutting down textile mills. At the same time mercantile credits for Russian imports swelled in volume and became more than ever parlous. The chervonet (10 rubles) is nominally worth $5.146 and is officially held at par with all gold currencies, but illicit "underground" transactions with nearby countries were reported on a basis of 5 cents per ruble.

THE SILVER EXCHANGES

On June 21 the price of bar silver at New York dropped to 33¼ cents per ounce, the lowest price for silver in authentic records covering nearly three centuries. The highest price, in the early part of the year, was 46⅞ cents per ounce, but there was an upward trend after June. The fluctuations in Chinese exchange, therefore, have not been equalled since 1920. The principal causes of the slump in silver were: the decline in world price levels; continuing heavy silver production largely as a by-product of other ores; huge silver stocks of the Indian Government held for sale on price rallies; recent or projected demonetization of silver by various countries (Indo-China, Persia and Hongkong), and continuing turbulence in China.

LIFE INSURANCE

By Joseph B. Maclean

Associate Actuary, Mutual Life Insurance Company of New York

EFFECT OF THE DEPRESSION

The financial collapse in 1929 had, at first, little effect on life insurance companies, which are not investors in common stocks, and the only immediate effect was a sharp rise in the demand for policy loans. In 1930, however, the companies have, with few exceptions, experienced to a considerable extent, although not in the way of financial loss, the effects of the depression. For the first time in nearly ten years new ordinary business written shows a decline as compared with the previous year. This also occurred in 1921 but on that occasion the decrease was due to the abnormally large new business in 1920 rather than to unfavorable conditions in 1921. On the other hand lapses and surrenders have greatly increased. The abnormal demand for policy loans has shown no tendency to diminish while it is more than probable that a further result of the depression has been a substantial increase in the number of claims presented for disability benefits.

NEW INSURANCE

The following table shows for 44 companies having over 82 per cent of the total existing business in force in the United States the amounts of Ordinary, Industrial and Group Insurance written during the first ten months of 1930 with the figures for the same period of 1929 and 1928:

(Association of Life Insurance Presidents)

(Millions)

	1928	1929	Per cent	1930	Per cent
Ordinary	$ 6,722	$ 7,256	8.0	$ 7,172	—1.2
Industrial	2,244	2,415	7.6	2,414	—0.04
Group	1,058	939	—11.3	902	—3.9
Total Insurance	$10,024	$10,000	5.8	$10,000	—1.2

Ordinary.—The year began with a normal increase of 8 per cent in January but business immediately thereafter began to fall off and by the end of the first quarter the increase over 1929 had fallen to 7 per cent and at the end of six months to 3.5 per cent, the figures in and after the month of May showing an absolute decrease as compared with the previous year. The decrease in May and June was about 3 per cent. July showed some recovery but in August, September and October the decrease jumped to over 10 per cent, being at its maximum, about 12½ per cent, in October. The extent of the loss in new business represented by these percentages is very great. It means that in each of the last three months mentioned, new business was about $75,000,000 less than in the preceding year while for the whole period of ten months the loss in production has been $85,000,000. For the whole year it is probable that the decrease will be over $300,000,000, assuming no improvement in present conditions. This figure, of course, does not represent the full extent of the falling-off since normally there would be an increase in new business of over $500,000,000. It may be said, therefore, that the economic depression has resulted in a total decrease in ordinary life insurance production of close to $1,000,000,000.

Industrial.—The total amount of industrial insurance written was almost exactly the same as in the first ten months of 1929 whereas that year showed an increase of 7.6 per cent over 1928, representing nearly $200,000,000 of insurance. The figures for 1930 would have been less favorable if it had not been for the abnormally large production of a single month in which an increase of nearly 30 per cent was recorded representing $70,000,000 of insurance. Probably the figures for the whole year will be about the same as for 1929.

Group.—Figures for group insurance are subject to such large fluctuations even in normal times that no valid conclusions can be drawn from a comparison of the production of one year with that of another. A single group contract may be so large as to cause an increase in the combined figures of over 100 per cent for the month in which it is written with a correspondingly opposite effect in the same period of the following year. The comparatively large decrease in 1929 was largely due to such a cause and the smaller decrease for 1930 is, therefore, more significant than appears at first.

LAPSES AND SURRENDERS

As shown in the accompanying table surrenders increased considerably in 1929. The same was true of lapses, and while no figures are available at present for 1930 there will undoubtedly be a further large increase in the amount of insurance terminated by the action of the policyholder through surrender or lapse. A considerable increase in surrenders was to be expected as a result of the large increase in policy loans. Some indication of the possible extent of the increase in terminations of this character may be gathered from the fact that in one large company surrenders for the first nine months of 1930 showed an increase over the corresponding period for 1929 of about 20 per cent while other lapses had increased nearly 30 per cent. The figures for other companies may, of course, be quite different.

SURRENDERS AND LOANS

(Companies reporting to the State of New York)

(Millions)

Year	Number of Companies	Amount in Force at End of Year[1]	Amount of Policies Surrendered[1]	Amount Paid for Surrendered Policies	Policy Loans at End of Year
1929................	49	$69,886	$1,370	$375	$1,992
1928................	48	64,367	1,134	307	1,663
1927................	48	58,649	1,072	268	1,484
1926................	44	53,680	864	236	1,336
1925................	41	47,481	748	207	1,212

[1] Includes Group Insurance but not Industrial.

INCREASE IN POLICY LOANS

The increase during 1929 in amount of policy loans outstanding in the companies reporting to the state of New York was $330,000,000, as against a normal increase of less than $200,000,000. The excess amount was practically all loaned in the last three or four months of the year, and in many companies special measures had to be taken and staffs increased to handle the great increase in the number of daily transactions. Perhaps the only satisfactory feature of this situation from the companies' point of view was that it brought prominently before the public the facts that a life insurance policy is a quickly realizable asset and also that the companies are well able to meet such an abnormal demand for ready cash, a demand which amounted almost to a "run on the bank." By the end of 1929 the proportion of policy loans to total assets in all companies had increased by slightly over one per cent, representing in the aggregate an addition of nearly $200,000,000 to the amount loaned in this way. It seems likely that a further increase in about the same proportion will occur in 1930 as financial conditions have become worse rather than better. Although policy loans represent a perfectly secured investment yielding a high rate of interest all companies prefer to keep the amount so invested as low as possible. Few policy loans are repaid in cash and more often than not a policy loan is merely the prelude to lapse or surrender. Thus, the effect on the business generally is bad to say nothing of the fact that from the insured's standpoint policy loans defeat the purpose for which the insurance was taken.

DIVIDENDS AND INTEREST RATE

(Insurance Year Book)

Year	Number of Companies	Dividends Paid (Millions)	Rate of Interest on Mean Invested Funds by 100 Life Insurance Companies Per cent
1929	353	$513	5.33
1928	331	466	5.30
1927	319	418	5.32
1926	322	376	5.29
1925	308	351	5.34

DIVIDEND SCALES

Very few changes in dividend scales took place in 1929 and the increase in amount paid is mainly due to the larger amount of insurance in force and to the fact that dividends on a given scale normally show a slight increase for each policy with increasing duration. In the years immediately preceding 1929, increases in the dividend scales themselves caused a greater relative increase in the payments as between one year and another. The chief reason for the general retention of existing dividend scales in 1929 was the somewhat less favorable mortality experience. The general tendency of the mortality rate from year to year has been to decrease. For several years prior to 1929 the experience of the companies generally has been very favorable and this has enabled greatly increased dividend payments to be made. Practically all companies, however, experienced an increased ratio of actual to expected mortality during 1929 and while no important company found it necessary to decrease the dividend scale, the excess mortality was sufficient to prevent further increases except in a very few companies. It is not easy to predict probable action in regard to dividends for 1930. Some companies have continued to experience a relatively high mortality while others have not. A bulletin issued by the Metropolitan Life Insurance Company in November, 1930, stated that "1930 continues to be a year of best records in public health not only in its low mortality rate but also for new minimum death rates for several diseases which are of major importance. . . ." If this is the general experience we may again see some dividend increases in 1930 especially as the reduction in new business and the increase in lapse and surrender both have a favorable effect so far as the amount of available surplus is concerned.

ASSETS – INCOME – DISBURSEMENTS

Including Ordinary, Industrial and Group Business
(Insurance Year Book)
(Millions)

Year	Number of Companies	End of Year		Premiums Received	Total Income	Total Payments to Policyholders	Total Disbursements
		Admitted Assets	Surplus[1]				
1929	353	$17,482	$1,767	$3,350	$4,337	$1,962	$2,882
1928	331	15,961	1,678	3,146	4,088	1,699	2,548
1927	319	14,392	1,537	2,874	3,673	1,500	2,295
1926	322	12,940	1,364	2,624	3,330	1,373	2,124
1925	308	11,538	1,234	2,384	3,018	1,243	1,936
1924	297	10,394	1,137	2,122	2,703	1,174	1,813

[1] Includes amounts set apart for dividends to policyholders during following year.

DISABILITY BENEFITS

Standard Provisions.—The year has been one of outstanding importance in connection with the finances and administration of the disability benefits which are now included in a very large proportion of all life insurance policies issued. In the AMERICAN YEAR BOOK for 1929 reference was made to the recommendations of the committee appointed by the National Convention of State Insurance Commissioners to consider the question of standard provisions for such benefits and to the fact that a number of the departments had by ruling or otherwise required the adoption of standard provisions in respect to all such policies issued on or after July 1, 1930. Additional states have since made similar rulings and with comparatively few exceptions the use of the new standard provisions has now become general.

Total Disability.—There are two important features in regard to which the standard provisions differ from the former existing practice. The contingency now insured against is total disability which has lasted at least four months. Formerly the usual qualifying period of total disability was 90 days, while in the event of occurrence of disability which was admittedly total and permanent, as cancer or total blindness, benefits became payable immediately and in addition certain "specified disabilities" such as loss of both legs or arms were assumed to be permanent before having continued for the specified premium period. The increase from three months to four months eliminates at least some of certain purely temporary disabilities the inclusion of which is not appropriate in a so-called "total and permanent" disability clause and will to that extent effect a further reduction in the actual cost of coverage. Companies may adopt a qualifying period of more than four months, but not more than one year, but it is unlikely that any will do so, the four-month period being generally regarded as "standard."

Payments.—No disability income payments may be made in respect to the first three months of total disability, the first payment being made as at the end of the fourth month. Moreover, in delayed claims no payments may be made as of a date more than one year prior to notice of claim. Premiums, however, which fall due after commencement of disability must be waived if the due date was not more than six months prior to notice. Most companies allow a period of one year in lieu of six months. These provisions are much less liberal than the previous practice of a number of important companies whose contracts provided for payment for the whole period of disablement and, in at least one case, for unlimited "dating back" both of disability income payments and premium waiver.

Other Provisions.—The so-called "professional man's policy," which defined disablement as inability to follow "the customary occupation," is eliminated. Such policies may, of course, still be issued in certain states which have not adopted the standard provisions. "Increasing Benefits," i.e., disability income increasing after 5 and 10 years' disablement, as previously issued by certain companies, are prohibited. Recognition of claim must be made in certain cases where disability commenced during the grace period of a premium in arrears. The extension of disability coverage beyond age 60, except for certain special forms, is not permittted.

PREMIUM SCHEDULES

Increased Rates.—The adoption of the new provisions was made the opportunity for putting in force new and, in most cases, greatly increased premium schedules so that not only are benefits now generally lower but premiums for the reduced benefits are higher. This was essential since it had become evident that the rates were inadequate and nearly all companies had consequently sustained losses on this class of business. The extent of the increase in disability claims and of the growth in importance of the business may be realized from the fact that the benefits paid by six large companies increased from $5,000,000 in 1924 to $22,000,000 in 1929. Premium rates for the standard disability benefits while not uniform are very much nearer so than formerly. The provisions of the contracts of the different companies still show some variations while differences in the interest basis and "loading" for expenses also cause variations in premiums.

DISABILITY BENEFITS FOR WOMEN

An important change in practice which has accompanied the change of contracts and increases in rates has been the general recognition that terms for disability benefits for women must be different than for men. It has become clear that the risk is much greater, double or perhaps even more than double, in the case of women. Different companies have handled this matter in different ways. Some have simply doubled the rates for women, leaving the contracts otherwise the same as for men. Others, while charging the same rate, pay only one-half of the disability income in addition to waiving the premium. Others are charging a rate of 50 per cent higher and limiting coverage to age 55 instead of 60. Many companies now provide for cancellation of the coverage at marriage.

RESERVES AND DIVIDENDS

The existence of a large volume of insurance in force carrying disability benefits at inadequate rates of premium is something which naturally causes the companies deep concern. The publication in 1930 of new tables of reserves for disability benefits based on the companies' own experience (see American Year Book for 1929) now provides for the first time a satisfactory reserve basis and the state of New York has already intimated that the new tables will be the minimum standard of reserves for all policies issued after June 30, 1930. The superintendent, at the same time, suggested the advisability of adjusting dividends on those policies which carry insufficient rates of premium for disability benefits and at least one large company has already decided to make such an adjustment in 1931.

INDUSTRIAL INSURANCE

(Insurance Year Book)

(Millions)

		Insurance in Force at End of Year			
Year	Number of Companies	Number of Policies	Amount	Premiums Received	Losses Paid
1929	68	89	$17,902	$1,405	$299
1928	65	86	16,686	1,289	259
1927	58	82	15,448	1,137	219
1926	49	76	14,035	1,040	203
1925	60	74	12,824	941	176
1924	54	68	11,344	818	153

UNITED STATES FRATERNAL ORDERS

(Insurance Year Book)
(Millions)

Year	Number of Orders	Assessments	Total Income	Claims Paid	Total Disbursements	Assets at End of Year	New Business	No. of Certificates in Force at End of Year	Amount in Force at End of Year
1929	269	$200	$258	$154	$201	$834	$ 984	9	$9,155
1928	262	197	245	140	182	824	1,040	9	9,324
1927	235	193	238	133	171	760	1,026	8	9,727
1926	249	182	224	121	159	660	1,033	9	9,835
1925	224	188	222	121	160	628	1,106	8	9,770
1924	228	186	216	116	153	566	1,097	13	9,806

FIRE INSURANCE

By Edward R. Hardy

Secretary-Treasurer, Insurance Institute of America

Depression Influence.—The period of depression through which the country is passing and similar periods affect fire insurance as they do the other forms of business, but fire insurance does not feel the effects at once—indeed, hardly commences to feel them until a year after the period of depression has begun. This is due to the fact that insurance policies are written for periods of from one to three years. They are not cancelled when a period of depression begins and lower values come into force, but are carried to expiration. Until that time arises and the policies are renewed, the effect of the period of depression does not begin.

Volume of Underwriting.—Again, a five-year period is deemed rather necessary to furnish a true picture of fire insurance and the allied lines written by fire insurance companies. *Best's Insurance News* has recently compiled figures for the five-year period 1924-1929. The total volume of business done by the fire companies in 1924 was $849,000,000; in 1929, $1,005,000,000, omitting thousands and hundreds in both cases. The increase was put at 18.4 per cent. These figures were for all clasess of business written in these two years. For the classes other than fire, but written by fire insurance companies the premiums for 1924 were $200,000,000 and for 1929, $284,000,000; an increase of 41.6 per cent. These figures illustrate the fact that the allied lines which are now approximately one-fourth of all the business written by the fire companies are showing a more rapid increase than the fire line itself. It should be noted, however, that two forces tend to reduce the receipts from the fire business, although the volume increases. These forces are the enormous amount of construction for dwelling purposes within the last few years, all of which carries substantially low rates, and the increasing development of the practice of sprinkling properties devoted to manufacturing and mercantile purposes. The classes of business written by fire insurance companies are: Fire, Ocean Marine, Motor Vehicle, Earthquake, Inland Navigation and Transportation, Tornado, Hail, Sprinkler Leakage, Riot, Explosion, Aircraft, etc. The results for 1930 will show decreases in the volume of business over 1929 of approximately 15 per cent. These decreases vary with different companies, but by and large, the general effect will be substantially that percentage. The increase in 1929 over 1924 in the fire line alone was 11.3 per cent. This will probably be about lost in 1930. In other words, the business will approximate more nearly the 1924 than the 1929 conditions.

Increased Losses.—The losses are

running somewhat heavier, showing an increase of approximately 10 per cent in 1930 as compared with 1929. This increase will also affect the companies because the increased losses will be measured against a decreased premium. The fire companies for three years, 1927, 1928, and 1929, made a profit on their underwriting which had not been true for some years before. The profit on underwriting means that the premium receipts were sufficient to pay all the losses and expenses and take care of the increased reserve for increased liability and still have some profit. These companies have their investments in the stocks and bonds of the industries of the country to an appreciable extent at least and their balance sheets will be affected by the decreased values, but that is true of all bodies.

MARINE INSURANCE

By Douglas F. Cox

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So far as figures are concerned, it is impossible to review satisfactorily the business of 1930 at the present time, as the annual statements of the companies will not be published in comprehensive form until about the middle of the year 1931. The latest available figures indicating volume, results, etc., are therefore those relating to the business transacted in 1929.

TREND OF THE BUSINESS

It appears that in 1929, as compared with the previous year, there was an increase of 26 in the number of companies transacting Marine Insurance. This does not mean the formation of new companies for the purpose so much as the entrance of fire companies into the marine field. This has gradually come about through the demand by the agents of fire companies that those companies furnish their agents with the same facilities as are enjoyed by agents of the companies which have been doing both classes of business. This pressure would not perhaps have been so great if it were only what is known as "Ocean Marine" that was involved, but as explained in last year's review, that division of the business known as "Inland Marine" which includes insurances upon all kinds of property when the element of transportation or transit is present, ranging all the way from Sound and River steamers to personal effects in possession of the owner, has grown to equal importance and, moreover, can be produced by agents in any part of the country, not only by those in seaports and shipping centers. This trend is illustrated by the following tabulation of the number of companies doing marine business in 1929 and the preceding three years:

	Ocean only	*Inland only*	*Both*	*Total*
1926......	8	39	74	121
1927......	6	42	84	132
1928......	6	60	94	160
1929......	5	72	109	186

VOLUME OF PREMIUM

The aggregate amount reported by the companies as premium written in 1929 was Ocean $48,255,000, Inland $45,844,000, which when compared to the previous years, shows a moderate increase in Ocean premiums of $1,836,000 and a decrease in Inland of $1,118,000. The latter may perhaps be attributed to reduction in rates due to competition caused by the influx of new companies.

UNDERWRITING RESULTS

The amount of losses incurred on the premiums written in 1929 is not available but the losses reported by the companies as paid during the year amounted to Ocean $28,608,000, Inland $18,945,000. In the Ocean division these figures show a loss ratio of slightly less than 60 per cent, which is about the same as in 1928 and is close to the border line between profit and loss, dependent on whether the expense ratio (which includes commissions, etc.) of any company is more or less than 40 per cent. It seems safe to infer that some companies made a profit and many suffered a loss. In the Inland division the losses paid were $18,945,000, which shows a loss ratio of about 41 per cent. This ratio is nearly double that shown by the figures of 1928 which may be the result of reduction in the rates of premiums due to the increasing number of new companies in the business, as suggested above.

PROSPECTS

Although complete figures for 1930 have not been published, it is generally understood and it seems to be inevitable that they will show a considerable decrease in premiums written, as the same world-wide depression in business generally has naturally resulted in a serious decrease in the quantity of merchandise in transit by water and by land. Moreover, the values of such quantities as have been moved have been on a greatly reduced basis. The volume of premium on the hulls of vessels must also be less, as so many of them have been laid up because of the lack of cargo requiring transportation. On the other hand, the number of losses seems to have been at least as high as usual and this, on a falling volume of premium, will probably result in loss to the companies on the year's business.

These remarks apply to the Ocean division, but in the Inland division also, although it has hitherto been fairly profitable, the results in 1930 seem likely to be poor. It would be surprising if it should prove to be otherwise in view of the decrease in volume of business generally, the increased competition through the entry of new companies into the field and the fact that the influence of bad "moral hazard" which is always more noticeable in times of depression, affects this division especially because many of the policies cover property in the hands of the owner.

FOREIGN MARKETS

In September, the annual meeting of the International Union of Marine Insurance was held at Vichy. The representatives of the companies from Great Britain and the various Continental countries were practically unanimous in their reports of conditions in their respective markets, to the effect that, while rates on hulls are more nearly adequate than they have been in recent years, cargo business continues to be done at less than cost and uncontrolled competition nullifies all efforts to improve the situation. Some important German companies doing a large marine business have made disastrous failures. It has been pointed out before that marine business is so international in its character that bad conditions in foreign markets make it impossible to do the business here on a satisfactory basis.

INLAND MARINE CONFERENCE

Much interest has been evinced in the efforts put forth during the year by the leading companies in the Inland business to establish an organization to stabilize rates and conditions in that part of the business which consists of policies covering personal effects of tourists, personal jewelry, personal furs, Jeweler's Block, etc. These are generally known as "floater policies"; they constitute a very important class and if the efforts to stabilize fail, there is every prospect of a disastrous rate war which will in all probability seriously affect the fire insurance business, as it is done through the same agents and unrestrained competition in the one class will lead to similar conditions in the other.

CASUALTY AND MISCELLANEOUS INSURANCE

By R. Duncan Reid

President, Globe Indemnity Company

ECONOMIC CONSIDERATIONS

Depression and Adjustment.—Developments in the casualty-surety field during 1930 were primarily interesting, no doubt, in their relation to what has been aptly termed "national financial indigestion" that followed the collapse of the "new era" inflation. During the last five or six years of the bull-market prosperity more than 100 new stock casualty insurance companies were launched with a total capital and surplus amounting to almost $100,000,000. Even before the puncturing of the bubble, it was apparent that there was neither enough business nor enough underwriting ability available to show a profitable return on such a large amount of capital. With the disturbed economic conditions which have prevailed throughout 1930, it would not be surprising if a considerable part of this capital were withdrawn from the casualty-surety business by the retirement of some of these companies. Although this inevitable operation of the survival-of-the-fittest principle will work some individual hardships, there are good reasons for regarding it as a healthy development. It is noteworthy that casualty-surety companies stood firm against the disturbing influences of the depression period, despite the tremendous total represented by their outstanding financial obligations. No failures worthy of note have been recorded and the vast invested funds of the companies generally are solidly safeguarded.

Premium Volume and Ratio.—In the various underwriting fields covered by casualty-surety companies we may this year look back upon the unfortunate combination of a noticeable decrease in premium volume and a sharp increase in the loss ratio. Although this condition would not prevail as regards all lines, all parts of the country, or all companies, it is sufficiently general to establish a trend which will unquestionably be reflected in the financial statements of the leading casualty-surety companies.

AUTOMOBILE INSURANCE

The Burden of Claims.—Automobile insurance, always an important field for casualty companies, did not contribute any significant constructive developments during the year. Both in those states which have enacted financial responsibility laws and in those which have not, there has been abundant evidence of continued careless driving. Claims under automobile policies have been numerous and the settlement of these losses has involved an unusually heavy outlay by the companies. Although economists have been able to plot a downward curve for commodity prices and stock values, statisticians have not, as yet, been able to plot a downward bend to the curve which shows jury awards in cases which involve personal injury, death, or damage to property attributed to automobile accidents. There have been continued efforts to check the rising tide of automobile fatalities, and the imperative need for still more determined work in this field cannot be overemphasized in view of the alarming increase in fatalities resulting from what would be preventable causes if the national consciousness could be sufficiently aroused.

Safety Measures.—"Save-a-Life" motor vehicle campaigns have been sponsored by a special division of the National Bureau of Casualty and Surety Underwriters and educational literature has been widely disseminated by the National Safety Council. Numerous local organizations have also interested themselves in this humanitarian work. Conceding that worth-while results have followed these concerted efforts to prevent needless sacrifice of human life, and conceding that motor vehicle financial responsibility laws have to some extent reduced the amount of careless driving, the fact remains that automobile deaths are stubbornly and alarmingly on the increase, so that the problem is still serious enough to challenge the best efforts of every one in the country to improve conditions.

WORKMEN'S COMPENSATION

Conditions.—Developments in Workmen's Compensation business during 1929 were discouraging; the experience for that year was the worst in the last decade, and conditions during 1930 have not shown improvement. The companies cannot be accused of indifference or lack of intelligent study for no class of insurance calls for and receives more anxious thought, more careful supervision, more expert engineering skill. It is possible to convert a poor risk into a good one by the enthusiastic cooperation of the employer and the application of specialized engineering knowledge, and good and effective work of this character is being accomplished on many large risks. But the small risk is always liable to have a serious and costly accident and the accumulation of such cases undoubtedly is responsible in large measure for the unsatisfactory results.

Equalizing Rates.—For several years compensation rate-making bodies have been studying the problem of how best to equalize the rates chargeable for large and small risks in the same classifications. Statistics have shown a variation in loss ratio as between large and small risks, and it is easily demonstrable that many factors of expense entering into the cost of handling Workmen's Compensation vary widely by size of the risk. In the fall of 1930, the first comprehensive program to accomplish this equalization was proposed by the National Bureau of Casualty and Surety Underwriters. The plan contemplated the application of an "expense constant" of $10.00 to be charged on each compensation policy to cover the initial cost of recording and collecting the premium for such a policy. It was also proposed that the rate loadings representing the cost of handling claims, safety engineering work, the making of payroll audits, and all other expenses should be apportioned to the size of the risk to the end that the smaller risks would pay for the necessary costs of handling them and the larger risks would not be overburdened with an excessive cost for this service.

Commission Grading.—As a part of the program there was also included a proposal to grade the commission payable to producers of the business for procuring and servicing it in the field. This proposal of reducing the producers' rate of commission on the larger risks met with unanimous opposition from the organizations representing the various types of insurance producers, and at this writing this phase of the program is not being pressed by those in charge of compensation rate making for stock casualty companies. However, the opinion is generally held that a graduation of expense loadings by size of the risk will be a part of the compensation rate-making procedure in the early future.

The Case of State Funds.—In view of the obviously unprofitable nature of workmen's compensation insurance, it is curious to note the attempts in various quarters to enact legislation for the establishment of monopolistic state funds to provide such insurance. These attempts are more or less spasmodic, and usually futile, as unfortunately the sound judgment of the people prevails. The latest and most striking illustration of this was found in Missouri where at the November elections the people of the state rejected, by a vote of more than 3 to 1, an initiative measure which contemplated a monopolistic state fund for the writing of workmen's compensation in that state.

PREVENTION OF INDUSTRIAL ACCIDENTS

Safety Measures.—Notable progress was made during the year in the development of ideas for the prevention of disabling and fatal accidents in industry. Engineering improvements in design of machine tools for the advancement of safety were numerous and effective. Material advance was also made in further arousing the interests and active cooperation of executives, supervisory staff and employees in safety campaigns of various kinds carefully planned to meet the varying conditions in the different kinds of industries. In their efforts to reduce the frequency and seriousness of industrial accidents, the casualty companies were assisted in a very practical and effective way by State Labor Departments which sponsored statewide "No Accident" contests over specified periods, the successful contestants having had their achievements recognized by awards which inspired a real spirit of competition.

Results.—The results in this field prove conclusively that accident experience as it relates to industry and the community can be controlled if there exists the "will to do," and it may safely be predicted that the casualty companies will not relax their vigorous efforts to bring this about. Wholly apart from humanitarian considerations, the prevention of industrial accidents is an economic problem of major importance. Such accidents represent waste through the loss of productive time, and as the "return to prosperity" will call for increased efficiency through the elimination of waste, it is apparent that the casualty companies' resources of experience, organization and equipment for helping employees to reduce this form of waste will be applied to particularly good purpose.

CRIME INSURANCE

That crime flourishes during a period of depression is known to everyone. According to crime statistics compiled by the Bureau of Investigation of the Department of Justice on the number of grave offenses known to the police, robbery, burglary, larceny and theft comprise the major part of the more serious criminal activities. During the year, claims paid under burglary and robbery losses have been abnormally frequent and heavy, showing a marked increase over 1929. Particularly serious have been the bank losses in this field, banks having been the special objective of highly organized criminal gangs of the most desperate type. This class of claims has developed the fact that amounts of insurance protection which banks formerly considered adequate have, in many instances, been so far exceeded by actual losses as to make for a sharp upward revision in policy limits, with the probability that larger amounts of this form of protection will be more generally carried in the future.

FIDELITY BOND LOSSES

Financial and economic conditions have affected the surety classes to a considerable extent. Fidelity bond losses in particular have shown a significant increase, with the probability that in addition to the many heavy losses already reported there will be many more which will not come to light until after the first of the year. The promptness with which the surety companies have paid such losses emphasizes the service which they are rendering at a time when every stabilizing influence is particularly important to the business world. Incidentally, it serves as a vigorous reminder of the many reasons which make corporate surety preferable to the now obsolescent form of personal surety.

CHRONOLOGY OF FINANCIAL EVENTS, 1930

(From *The New York Times*, Dec. 31, 1930)

JANUARY

Jan. 2.—Stocks opened strong but closed weak. Wheat for March delivery sells at $1.33⅞, highest price in three weeks and highest for the month of January. Silver bullion at London 21⅝d. per ounce. Steel output estimated between 50 and 60 per cent of capacity. Call money 6 per cent, sterling $4.87⅜.

Jan. 3.—Call money 5 per cent, sterling, $4.87¼. $8,500,000 gold taken at New York, for Paris.

Jan. 6.—Wheat at $1.28⅞. Silver bullion sells at 20⅝d., lowest price in a century. Call money 4½ per cent, sterling $4.87. Bank of England takes in $6,000,000 gold.

Jan. 7.—Call money 4 per cent. Sterling $4.86¾. Stock market weak.

Jan. 8.—Transactions on Stock Exchange in 5-hour day 1,638,000 shares. Silver goes to new low price of 20 5-16. Steel output estimated 60 per cent of capacity.

Jan. 10.—United States Steel reports unfilled orders at end of December 291,848 tons up for the month.

Jan. 13.—Stock market motionless, only 1,452,000 shares dealt in, smallest 5-hour day since July, 1928.

American Telephone and Telegraph 5 per cent loan for $150,000,000 offered at 99½ per cent largely oversubscribed. Silver bullion recovers sharply to 21 7-16d. Reichsbank discount rate reduced from 7 per cent to 6½.

Jan. 14.—Silver falls to 21⅛.

Jan. 15.—Steel output estimated 65 per cent of capacity, as against 59 per cent in December and 85 per cent in January, 1929. Iron Age "composite price" of steel products at the lowest since July, 1928, average of 2.319, comparing with 2.412 in July of 1929. Labor Bureau reports manufacturing employment in United States lowest since 1922.

Jan. 16.—Stock Exchange sales rise to 3,000,000 shares. Stocks irregular. Rediscounts by member banks at the whole Federal Reserve system smallest since February, 1928. New York bank's rediscount smallest since June, 1927.

Jan. 17.—Wheat falls to $1.20⅞ for March delivery, as against $1.33⅞ at the beginning of the month. Sterling falls to $4.86⅜.

Jan. 20.—Stock market dull. Automobile output for December, 119,950 cars, lowest monthly figure since February, 1922.

Jan. 22.—Car loadings reported for second week of January smallest for that week since 1922. Steel output estimated 67 per cent of capacity.

Jan. 23.—Stock market recovers. Sales on Stock Exchange pass 3,000,000 shares for first time in new year. Sight sterling 4.86 3-16, lowest since Oct. 11. Paris Exchange also lowest since that date.

Jan. 24.—Stock market recovery continues; day's sales 3,500,000.

Jan. 25.—Week's bank clearings reported as decreasing 26⅞ per cent from 1929 in country as a whole, 35½ per cent at New York City.

Jan. 27.—Sterling at $4.86⅛, lowest since Oct. 11.

Jan. 28.—Stock market weaker. Wheat falls to $1.19⅝, lowest of crop season except for $1.17½ on Wall Street's day of liquidation, Nov. 13. United States Steel Corporation reports fall in earnings from $22,000,000 in October to $15,900,000 in December.

Jan. 29.—Stocks higher, silver lower. Time money slightly advanced. Wheat falls to $1.18. Steel output estimated at 75 per cent of capacity. Iron Age "composite price" for steel products lowest since 1927 and below any monthly average since 1922. Weekly car-loading statement lowest for period since 1922.

Jan. 30.—Bank of France reduce official discount rate to 3 per cent, lowest since 1912. Silver weak. Wheat falls 3 cents to $1.15½, lowest yet reached on this crop. Cotton falls to 16⅛ cents a pound, lowest since June, 1927.

Jan. 31.—Wheat falls to $1.13¾, recovering later. Silver bullion at London declines ⅜d. to 20 pence per ounce, new low figure in modern history. Stocks advance on largest trading of month.

FEBRUARY

Feb. 1.—Wheat recovers 4 cents to $1.17¾ for March delivery.

Feb. 3.—Wheat breaks to new low figure of $1.13, cotton down ⅜ cent to 16⅛ cent per pound, against 17½ cents, highest of January.

Feb. 4.—Wheat falls to $1.12¼. Silver bullion at London reaches new low of 19 15-16 pence per ounce. German Reichsbank reduces rate from 7½ per cent to 6. Sterling and French exchange lowest since October.

Feb. 5.—Stocks advance, averages at highest for year to date. Day's transactions 4,362,000 shares, largest since Dec. 13. Steel output estimated at 76¾ per cent of capacity, against 60 per cent at opening of year. Cotton down to 15¾ cents.

Feb. 6.—Wheat at $1.12, new low.

Feb. 7.—Official rates reduced from 4½ per cent to 4 at New York Reserve Bank, from 5 to 4½ at Bank of England. Spot cotton falls to 15.20 cents, wheat recovers. Bank of England gains $3,800,000 gold consignment from Bank of Spain. Stock market lower, bonds strong.

Feb. 10.—Vienna bank rate reduced from 7 per cent to 6½. Steel orders at the end of January 51,517 tons above end of December. Cotton, wheat and other grains rise. Sterling at $4.85⅞, new low for year.

Feb. 11.—Stock irregular, wheat $1.19½, against year's previous low of $1.12. Cotton rises from 15.20 to 15.90 cents. Government offers $50,000,000 three-months' bills for discount.

Feb. 13.—Silver bullion 20⅜ pence, against 19 13-16 Feb. 4.

Feb. 15.—Silver bullion 20 pence, wheat $1.15¼. Sterling $4.85¾, new low. Government's offer of $50,000,000 Treasury bills taken at rate equivalent to 3.304 per cent, as against 3.276 per cent for the December offer.

Feb. 17.—Wheat breaks 3 cents to $1.12¼.

Feb. 18.—Stock market strong, sterling at new low point of $4.85⅝.

Feb. 19.—Stock market weak. Wheat breaks 3 cents to $1.09¾, spot cotton to 15¼ cents, against 16 the week before. Steel output estimated at 82 per cent of capacity, against 75 at beginning of February, 60 per cent on Jan. 1 and 88 a year before.

Feb. 20.—Wheat $1.07¾. Bank of England reserve ratio 61⅜ per cent, highest since 1896. Silver 19 13-16 pence.

Feb. 24.—Wheat falls 7 cents to $1.03. Cotton below 15 cents. Stocks weak.

Stocks rise rapidly in 3,000,000 share market.

Feb. 27.—Farm Board buying sends wheat to $1.09⅜.

Feb. 28.—Silver at London falls to 19⅛ pence, decline of 2 15-16 since Jan. 1. Wheat rises 4⅝ cents, rapid advance in stocks.

Feb. 25.—Wheat touches 98¾ cents. Decline in stocks.

Feb. 26.—Wheat recovers to $1.07¼.

MARCH

March 5.—Cotton at new low, 14.60c. Steel production reported 78 per cent of capacity, against 82 per cent two weeks before.

March 6.—Cotton, 14½c, lowest since 1927. London bank rate reduced.

March 7.—German bank rate reduced to lowest since currency reform of 1924.

March 10.—Rise in stocks. Cotton falls to 14c.

March 12.—Stocks break sharply in largest trading since Dec. 21.

March 13.—New York Reserve bank rate reduced to 3½ per cent, lowest since February, 1928.

March 15.—Treasury's offering of $450,000,000 nine months' certificates at 3¼ per cent elicits application for $1,291,000,000.

March 18.—Stocks advance; some gains of 7 to 10 points.

March 19.—Wheat and silver rise; stocks very strong.

March 20.—London bank rate reduced to 3½ per cent, fifth reduction in five months; stocks uncertain.

March 24.—Tariff bill passes Senate.

March 26.—Stocks break and recover; trading 5,000,000 shares for first time since Dec. 9.

March 28.—Largest stock market (5,065,000 shares) since November, 1929; prices advance.

APRIL

April 1.—Rise in stocks, business 5,395,000 shares.

April 2.—Steel output 78 per cent of capacity, against 75 per cent two weeks before.

April 4.—Excited rise in stocks, trading nearly reaches 6,000,000 shares.

April 7.—Stocks move uncertainly in another 5,000,000-share day.

April 9.—Many advances of 6 to 10 points in stocks; 5,100,000 shares dealt in.

April 10.—Stocks rise violently, touching year's highest average, then break rapidly; 5,6000,000 shares sold.

April 11.—$50,000,000 three-months' United States Treasury bills allotted at discount equivalent to 2.93 per cent interest.

April 15.—Price of copper cut from 18 cents a pound to 14; had been 24 early in 1929. Stock market not affected. Bid of 102,007 gets New York City's $31,550,000 4 per cent bond issue.

April 21.—Wheat falls 1½ cents, making six-cent decline for week; nearly at year's low level. Stocks weak.

April 23.—Steel trade operating at 80 per cent capacity, against 75 per cent month before.

April 28.—Sharp break in stocks, some declines of 10 to 18 points.

April 29.—United States Steel Corporation reports first quarter's net earnings $8,935,000 below 1929, but monthly earnings as rising from $15,404,000 in January to $18,103,000 in March.

April 30.—Steel activities down from 80 per cent to 78. A few stocks are bid up 8 to 13 points.

MAY

May 1.—New York Reserve Bank rate cut from 3½ per cent to 3, Bank of England rate from 3½ to 3. Bank of France rate lowered from 3 to 2½ per cent, lowest since October, 1898. Stock market breaks violently, "averages" down 5½ points, some stocks falling 10 to 18.

May 2.—Wave of liquidation on Stock Exchange, transactions nearly 6,000,000 shares. Long list of shares down 5 to 10 points.

May 3.—Another violent break in stocks; two-hour business reaches 4,800,000 shares, exceeding all previous Saturday records.

May 6.—Recovery in stocks; averages up 6⅜ points. Copper's price reduced again, from 13 to 12½ cents.

May 7.—Steel activity reduced to 77 per cent.

May 10.—United States Steel reports unfilled orders reduced 216,433 tons in April.

May 12.—Copper's price advanced to 13 cents.

May 14.—Steel activity down to 75 per cent.

May 17.—Two-hour Saturday sales of stocks 791,000 shares, smallest since August, 1928.

May 21.—Time money 3 per cent. lowest since 1924. Silver in London at new low record of 18⅝d.

May 26.—Stock Exchange tightens restrictions on listing of investment trust shares.

May 28.—Steel trade at 73 per cent capacity.

May 29.—Silver at 17 7-16d in London.

JUNE

June 2.—Stock Exchange sales below 2,000,000 shares in five-hour trading. Silver bullion falls to 17 3-16d.

June 3.—Silver breaks to 16 5-16d., heaviest decline of any day in 1930.

June 4.—Silver falls to 15 13-16d.

June 5.—Silver recovers to 16¾d.

June 6.—Stock market weak; numerous declines of 6 to 8 points.

June 7.—Another sharp break in stocks; sugar prices at low record.

June 8.—Stocks break heavily, "averages" down 6 points.

June 10.—Recovery in stocks.

June 11.—Stock market greatly unsettled. Steel production down to 69 per cent, against 82 in February.

June 12.—German Republic's 5½ per cent "mobilization loan" offered. American portion, $98,250,000, offered at 90, immediately subscribed. Bonds "when issued" sell on Stock Exchange at 91¼.

June 13.—Tariff bill passes Senate. Wheat and cotton fall; copper reduced to 12 cents.

June 14.—Wheat falls below $1, stocks weak.

June 15.—Treasury offers $400,000,000 one-year certificates at 2⅞ per cent. Applications $2,398,000,000.

June 16.—Extremely violent break in

stocks, "averages" down 11¾ points, some declines 15@20.

June 18.—Stocks break rapidly, day's sales 6,400,000 shares.

June 19.—New York Reserve Bank reduces rate to 2½ per cent, lowest in its history. Rapid recovery in stocks.

June 20.—Reichsbank rate cut from 4½ per cent to 4. Wheat falls to 93¾ cents.

June 21.—Stocks break again; many shares below 1929 lowest.

June 23.—Cotton falls to 13½ cents, wheat at 89½ cents.

June 24.—Heavy decline in stocks. Wheat down to 88¼ cents, lowest since 1914; cotton 13¼ cents. Silver 15 7-16d., lowest record of year until December.

June 25.—Stocks break to year's lowest, then recover. Wheat 87¾ cents, cotton 13 cents. Steel activities fall to 65 per cent.

June 26.—Call money 1½ per cent, lowest since August, 1917. Recovery in stocks, wheat and cotton.

June 28.—Two-hour sales of stocks, 586,000 shares, smallest Saturday since July, 1928.

JULY

July 3.—Stocks weak.

July 7.—Further decline of stocks. Wheat 87⅝ cents, cotton falls to 13.30 cents.

July 8.—Cotton falls to 13.15 cents on acreage estimate.

July 9.—Recovery in stocks, wheat and cotton.

July 11.—Wheat falls to 86½ cents; lowest of year to date.

July 14.—Continuous recovery in stocks. Life insurance companies report 1⅞ per cent increase in business over 1929 for six months.

July 16.—Recovery in stocks continues.

July 21.—Stocks break sharply. Gold import from Canada begins.

July 23.—Steel activities at 56 per cent, lowest of year to date, against 59 per cent in December, 1929. Cotton below 13 cents. Corn begins to rise on drought reports.

July 24.—Cotton 12.65 cents, lowest of year to date. Corn advances, private crop reports estimate 200,000,000 bushels loss since July 1.

July 25.—Corn at season's highest to date. Gold shipped to France.

July 26.—Corn rises to cents, making 14 cents advance since month began.

July 28.—Corn's price goes above wheat for first time in thirty-five years. Cotton 12¾ cents.

July 29.—United States Steel reports June quarter earnings $23,937,000 below 1929, or 33 per cent, but larger than in 1928, 1927, 1925 or 1924.

July 30.—Wheat at new low price of 83⅜ cents, cotton at 12.45 cents, lowest since 1921 except for one day in 1927.

AUGUST

Aug. 1.—Day's stock trading only 1,090,000 shares, smallest of any full day since 1926.

Aug. 4.—Corn rises 2¾ cents to 89¾, or 26¾ above low price of June 30. Wheat rises 4⅛ cents.

Aug. 5.—Corn rises 3¾ cents, wheat 3 cents. More gold sent to Paris.

Aug. 7.—Corn sells at $1.02¾, highest price for the whole of 1930 and 30½ cents above season's earlier lowest.

Aug. 8.—Heavy break in stocks; wheat and corn lower.

Aug. 11.—Corn advances; government report reduces estimate of yield 590,500,000 bushels from previous monthly estimate, indicating smallest crop since 1901.

Aug. 12.—Corn and wheat prices decline. Stocks break sharply.

Aug. 13.—Decline of 2¼ cents in corn to price 6½ cents below month's high price. Wheat falls 2⅝ cents. Corn still selling nearly 8 cents a bushel above wheat.

Aug. 15.—Treasury's $120,000,000 three months' bills taken at discount equal to 1.96 per cent interest. Cotton below 12 cents, first time since June, 1921.

Aug. 18.—Cotton 11 cents.

Aug. 20.—Corn rises 3 cents on further bad crop news.

Aug. 23.—Corn and wheat strong; stocks advance.

Aug. 29.—Stocks strong.

SEPTEMBER

Sept. 2.—Wheat breaks to new low price of 83 cents; corn falls from $1 to 97⅞ cents.

Sept. 3.—Wheat 82¼ cents.

Sept. 4.—Wheat falls to 81 cents.

Sept. 7.—News of revolution in Argentina breaks Argentine bonds heavily; other South American bonds fall.

Sept. 10.—Corn prices hold steady, despite government report's further reduction of 229,000,000 bushels in estimated yield; forecast being for crop 631,000,000 bushels below 1929 and, except for 1901, the smallest since 1894.

Sept. 11.—Corn and wheat decline.

Sept. 13.—Wheat falls to 80¼ cents; corn down 2 cents at 91⅞ cents.

Sept. 14.—German "Fascisty" gain of 95 seats in Reichstag, though failing of plurality. Party had advocated Adolf Hitler's policy to repudiate Versailles Treaty.

Sept. 15.—New German 5½ per cent bonds fall to 84¾, against issue price of 90; wheat down to 79⅛ cents; September corn 11⅜ cents above wheat, December nearly on level with wheat; copper reduced from 11 to 10¾ cents, lowest in 30 years; new German 5½ per cent bonds at 84¾.

Sept. 18.—Copper at new low price of 10½ cents; silver at London 17d, recovery of 1 9-16d since June.

Sept. 19.—Weakness in stocks. German 5½s heavily sold, falling to 81¾.

Sept. 20.—Wheat market upset by reports of selling by Soviet agents on Chicago market. Secretary of Agriculture Hyde denounces sales; grain market declares them normal.

Sept. 22.—German 5½s decline to 80, or 10 points below subscription price. Corn sells 14 cents under high price of August; cotton 10¾ cents, lowest since 1912, except during 1914 "war scare."

Sept. 23.—Wheat breaks to 77⅛ cents on forged telegram reporting that Canadian pool was about to liquidate.

Sept. 26.—Break in stocks, cotton.

Sept. 27.—Wheat falls to 74½ cents, new low figure; corn to 81⅞ cents, lowest since drought news of July became alarming.

Sept. 29.—Wheat at 72¾ cents, lowest since January, 1907. Stocks break.

Sept. 30.—German 5½s, 79½.

OCTOBER

Oct. 2—Recovery in stocks, grain and cotton.

Oct. 3—Stocks decline, grain and cotton advance.

Oct. 6—Heavy break in stocks.

Oct. 7—Cotton 10.15c.; lowest of year until December.

Oct. 9—Failure of Prince & Whitely announced on Stock Exchange. Severe break in stocks, led by U. S. Steel.

Oct. 10.—Abrupt recovery in stock market, many advances of 6 to 10 points, trading 6,300,000 shares.

Oct. 15—Stock Exchange recovery continues.

Oct. 16—Sharp recovery in German and South American bonds.

Oct. 17—Heavy break in stocks; averages go for first time under the low level of November, 1929. Day's average lowest since July 2, 1927.

Oct. 20—Vigorous recovery in stocks, large "bear repurchases" reported.

Oct. 22—Steel production estimated 53 per cent of capacity, against 55⅛ for September and 59½ for August. *Iron Age* describes consumption as "bumping rock bottom."

Oct. 24—Recovery in stocks and foreign bonds.

Oct. 30—Weekly steel production at 50 per cent.

NOVEMBER

Nov. 4—Republican defeat in Congressional elections.

Nov. 5—Break in stocks to new low level for year; wheat falls to 72½c, lowest for season to date. Cotton down ¼c.

Nov. 7—Stocks and bonds both very weak.

Nov. 10—Four-cent break in wheat; December delivery touches 69⅜c, lowest of 1930. Corn and cotton go lower.

Nov. 12—Week's steel trade activities estimated at 44 per cent. Copper price advanced slightly.

Nov. 13—Recovery in stocks, wheat advances. More cheerfulness in Wall Street. Farm Board supporting grain market.

Nov. 18—Copper price wavers.

Nov. 19—Steel trade activities 43 per cent.

Nov. 21—Bank failures in Middle West and South increase.

Nov. 25—Wheat and corn strong; financial markets dull under light trading.

Nov. 30.—Only 697,000 shares for two-hour Stock Exchange business.

DECEMBER

Dec. 1—Only 1,107,000 shares dealt in during five-hour session on Stock Exchange; second smallest full day of the year.

Dec. 2—President's message predicts $180,000,000 revenue deficit for U. S. fiscal year.

Dec. 3—Great dullnes in all markets.

Dec. 4—Stocks turn weak. Silver at London falls to 16d, against 17d on Sept. 18.

Dec. 5—Silver at 15⅞d.

Dec. 8—Treasury offers $250,000,000 one-year certificates at 1⅞ per cent, lowest since our government's short-term borrowing was instituted in 1917. Government estimates 236,000,000 bushels of wheat will be used for fodder in U. S., against 90,000,000 in 1929.

Dec. 10—Silver bullion reaches 15 7/16d in London, year's low price, touched also on June 24. Steel activities down to 38 per cent.

Dec. 11—Bank of United States suspends payments in New York City. Stock market not greatly affected. Cotton falls below 10 cents per pound for first time in 1930.

Dec. 12—Silver at London falls ½d to 15 1/16d per ounce, new low record in history. Cotton at 9⅞ cents, lowest since beginning of 1912 except for 1914 "war panic."

Dec. 13—Heavy Saturday liquidation, stock averages at new low level for the year. Corn and cotton decline again.

Dec. 15—Stocks break heavily again; Wall Street atmosphere at its gloomiest. Market supported, however, before the closing. Cotton falls below 9½ cents, a decline of 8¼ per cent in a week and 15 per cent in a month. Treasury's $250,000,000 certificate offer elicits $939,000,000 subscription.

Dec. 16—Silver bullion breaks ¾d per ounce at London to low record of 14½d. Cotton holds steady; stock market very weak again.

Dec. 17—Recovery in all markets; sharp upward reaction in silver. Stock market moves up rapidly after breaking in early hours to low level of the year.

Dec. 18—Census Bureau reports planting of Winter wheat nearly 99 per cent of previous Autumn's sowings. Stocks strong.

Dec. 22—Decline in stocks renewed. Corn and cotton markets weak; wheat prices supported by Farm Board.

Dec. 23—Chelsea Bank, one of the smaller New York institutions, closes as result of a run. New York Reserve bank reduces official rediscount rate to 2 per cent, lowest in the Reserve System's history and not matched at other central banks since the 2 per cent rate at the Bank of England in 1896.

Dec. 24—Receivership announced for the Seaboard Air Line. Stock market firmer. Steel trade production down to 35 per cent.

Dec. 26—Reserve System's gold holdings down to year's lowest.

Dec. 29—Call money in Wall Street rises to 4 per cent, highest since May 1 when Reserve Bank reduced official rate to 3 per cent. Wheat at Liverpool reaches low-record price.

Dec. 30—President Hoover announces agreement of Eastern railroads on a consolidation into four systems, one lesser point remaining to be settled by arbitration.

COGNATE SOCIETIES

American Economic Assn., Northwestern University, Evanston, Ill.

American Fair Trade League, 71 W. 23rd Street, New York City.

American Institute of Accounts, 135 Cedar Street, New York City.

American Institute of Weights and Measures, 33 Rector Street, New York City.

American Protective Tariff League, 33 E. 10th Street, New York City.

American Retailers' Assn., 128 W. 31st Street, New York City.

American Statistical Assn., Inc., 236 Wooster Street, New York City.

Central Assn. of Accountants, 51 Chambers Street, New York City.

Chamber of Commerce of the United States, 1615 H Street N. W., Washington, D. C.

Consolidated Stock Exchange of New York, 14 Pearl Street, New York City.

Consumers' League of New York, 289 Fourth Ave., New York City.

Cooperative League of America, 167 W. 12th Street, New York City.

Economy League, 1021 Park Ave., New York City.

Fair Tariff League, 40 Rector St., New York City.

Federation of American Industries, Inc., 511 Fifth Ave., New York City.

Franco-American Board of Commerce and Industry, 90 Fifth Ave., New York City.

French Chamber of Commerce, 4 E. 52nd Street, New York City.

General Society of Mechanics & Tradesmen of New York City, 18 W. 44th Street, New York City.

Home Market Club, 38 Chauncey Street, Boston, Mass.

Institute of Economics, 26 Jackson Place, Washington, D. C.

International Accountants' Society, 50 Broadway, New York City.

International Free Trade League, R.F.D. No. 2, Wilmington, Del.

Italian Chamber of Commerce in New York, 27 Cleveland Place, New York City.

League for Industrial Rights, 165 Broadway, New York City.

Merchants' and Consumers' League, 500 Fifth Ave., New York City.

National Association of Cost Accountants, 25 W. 43rd Street, New York City.

National Assn. of Credit Men, 1 Park Ave., New York City.

National Assn. of Real Estate Boards, 310 S. Michigan Ave., Chicago, Ill.

National Assn. of Retail Grocers, 601 Gumbel Bldg., Kansas City, Mo.

National Bureau of Economic Research, Inc., 474 W. 24th Street, New York City.

National Consumers' League, 156 Fifth Ave., New York City.

National Economic League, 6 Beacon Street, Boston, Mass.

National Foreign Trade Council, 1 Hanover Square, New York City.

National Research Council, 29 W. 39th Street, New York City.

National Wholesale Grocers' Assn. of the U. S., 6 Harrison Street, New York City.

New York Stock Exchange, 11 Wall Street, New York City.

Pan-American Advertising Assn., 32 Burling Slip, New York City.

Petroleum Export Assn., Inc., 25 W. 43rd Street, New York City.

Protective Tariff League, 137 Centre Street, New York City.

United Commercial Travelers of America, 632 N. Park St., Columbus, O.

DIVISION XI

AGRICULTURE AND ALLIED INDUSTRIES

CONDITIONS OF AGRICULTURE

By Arthur M. Hyde

United States Secretary of Agriculture

FARM INCOMES

Gross.—Farm incomes from the production of 1930 seem likely to be lower than for any season since 1921. The gross income from the 1929 production amounted to about $11,851,000,000, or about $110,000,000 greater than that for 1928. The aggregate gross income from the 1930 production will probably be about $9,950,000,000, or 16 per cent below 1929.

Net.—In 1929 the major farm expenditures showed very little change. Hence the increased gross income in that year resulted in an increase in net income computed as a return for the farm operator's capital and labor. The net income available in 1929 as a return for the operator's capital and labor was $1,055,000,000, as compared with $984,000,000 in 1928 and $1,206,000,000 in 1925, which was the best year since the post-war slump. Farm expenditures in 1930 were less than they were in 1929, but the reduction was small compared with the reduction in gross income.

Income Factors.—The reduced farm incomes of 1930 follow a series of years—1924 to 1929, inclusive—in which, despite diverse conditions in different agricultural sections, the aggregate income was fairly stable. In 1930 all sections suffered because of world-wide industrial depression. In a wide drought-stricken area the gross farm income was reduced about 25 per cent below that of 1929. In other sections the gross income, though greatly reduced, was better than it would have been had the drought not lessened the country's total farm production.

THE 1930 DROUGHT

Areas Affected. — The worst drought ever recorded in this country prevailed during much of the 1930 crop-growing season and greatly reduced farm production. Widespread droughts occurred in 1881, 1894, 1901, 1911, 1916, and 1924. These, however, did not equal the drought of the present year in duration, in the extent of the areas covered, in deficiency of precipitation, or in severity. Up to Sept. 1, 1930, an area in the Middle Atlantic States, comprising mainly Maryland, Virginia, and West Virginia, had deficient precipitation every month from December, 1929. Over much of the interior of the country, especially in the Ohio and middle Mississippi Valleys, the drought persisted for six months, from March 1 to Sept. 1.

Crop Conditions.—Crops were poorest from Virginia and Maryland westward to central Missouri, Arkansas, and Oklahoma. In much of this area, including most of Ohio, Kentucky, and West Virginia, the southern third of Indiana and Illinois, and south-central Pennsylvania, the yields were only about two-thirds of the normal. In a larger area the crops were somewhat less severely affected. This area included western Pennsylvania, Michigan, northern Indiana and Illinois, most of Iowa, the Dakotas and Montana, and the region from Kansas south to central Texas. On the other hand, crops were mostly average or better than the average in New England, New York, New Jersey, Nebraska, and Wisconsin. Fair yields were harvested in most of the Cotton Belt east of the Mississippi River. Particularly good yields were obtained in Georgia and South Carolina, and yields were above the average in Alabama. Satisfactory results were obtained also in most of the western states, with the exception of Montana and parts of Washington and Wyoming. In Colorado, Arizona, and Oregon crop yields were 13 to 19 per cent heavier than usual. They were about 10 per cent better than usual in California. Only in North Dakota, Montana, Oklahoma, Texas, and New Mexico, did the drought come early enough to reduce seriously the yields of wheat, oats, or barley. These crops, taking the country as a whole, yielded somewhat more than the usual average. Irrigated crops, such as sugar beets and some fruits largely grown outside the drought area, also produced well. Practically all non-irrigated crops growing late in the season, however, were affected, particularly the feed crops. Hay and pasturage suffered greatly.

Predicament of Farmers.—About 30 states, including all those in the great central area extending from Virginia to Montana and from Pennsylvania to Texas, were hard hit. In many localities farmers have little to sell and will be obliged to practice strict economy in their livestock feeding. In some parts of the country, thousands of farm families will suffer privation. Unhappily, moreover, the cut in farm production coincided with a sharp decline in the demand for farm commodities, and consequently in the farm-commodity price level. This development, a result of world-wide economic depression, bore heavily upon farmers outside the drought areas as well as upon those within it. Only in the case of a few commodities was the drop in production partly compensated by a rise in prices. Farm-commodity prices as a group slumped toward the end of the season to the lowest point in 15 years.

Relief Measures.—On August 14, at a conference of governors of drought-stricken states called by President Hoover, it was agreed that a committee representing the various Federal agencies concerned should be organized, that state drought committees should be set up, composed of state officials and farmer, banker, and Red Cross representatives, and that county committees should be organized in each county seriously affected by the drought. These county committees were to survey their local situations and determine the extent and character of the needs. The state and county committees were set up promptly in most of the states and in general have been active where definite need has existed. Surveys of needs are still in progress. The railroads cooperated by granting reduced rates on the movement of hay, feed, and water into drought-stricken counties, and livestock out of such counties into sections where feed is available.

Government Aid.—The Department of Agriculture assumed the responsibility for (1) determining the counties in which drought damage had been sufficiently severe to justify the granting of these rate reductions to farmer-consumers, and (2) issuing certificates recommending the granting of the rate reductions on specific shipments to farmer-consumers, or dealers. Several hundred counties were certified as in need of this aid. To aid in providing employment in the drought-stricken states, the Federal-aid road authorizations for the fiscal year 1932 were made available for the making of contracts for construction, and, under certain limitations, arrangements were made for payments on such contracts. The planting of fall pasture crops and gardens was urged, and in certain states loans were made to farmers to assist them in planting such crops. In other states seriously affected by drought, in which the seed loan appropriation was not available, the American Red Cross cooperated by giving seed rye for pasture to farmers who were unable to obtain it, and also by distributing seed for fall gardens.

CROP PRODUCTION

Wheat and Rye.—The wheat crop totaled about 840,000,000 bushels, as compared with 806,000,000 bushels in 1929 and an annual average of 833,000,000 bushels for the five years 1924-1928. Rye production, with yields close to the usual average, was estimated at 46,700,000 bushels, as compared with 40,500,000 bushels harvested in 1929 and an average production of 50,900,000 bushels during the five years 1924-1928. Among the grains principally used for human food only buckwheat was in seriously short supply.

Rice.—Production was estimated at 38,600,000 bushels, as compared with 40,200,000 bushels harvested last year and an average of 39,100,000 bushels harvested annually during the preceding five years.

Cotton.—Production was estimated at 14,486,000 bales, as compared with 14,828,000 bales harvested in 1929.

Feed Grains.—Total production of corn, oats, barley, and grain sorghums was estimated at only 90,000,000 tons, as compared with 103,000,000 tons in 1929 and an annual average of nearly 107,000,000 tons during the 5-year period 1924-1928. All told, the output of the principal feed grains is thus about 13 per cent less than in 1929 and 16 per cent less than the 5-year average.

Corn.—Production was estimated at 2,047,000 bushels, or 22 per cent less than the production in 1929 and 24 per cent less than the average annual production of the preceding five years and less than the production in any year since 1901.

Oats and Barley.—Oat production for the country as a whole was estimated at 1,410,761,000 bushels, or 15 per cent above the production in 1929 and 3 per cent above the average production of the 5-year period 1924-1928. The barley crop was estimated at 328,000,000 bushels, about 8 per cent more than the quantity harvested in 1929 and 36 per cent more than the average production of the preceding five years.

Grain Sorghums.—Including the grain sorghums that will be fed to livestock in the bundle, grain sorghum production was estimated at 79,232,000 bushels, as compared with 100,845,000 bushels in 1929 and an annual average of 128,175,000 bushels during the 5-year period 1924-1928. The output was lower than in any year since 1919, when the records on this crop were started.

Hay.—Production was estimated at 96,100,000 tons, or about the same as in 1926 and less than the production in any other year since 1918.

Tobacco.—Production was estimated in October at 1,500,000,000 pounds, the total including about 800,000,000 pounds of flue-cured tobacco and 290,000,000 pounds of Burley tobacco.

Fruit.—Production was at least one-fifth greater than in 1929. Prunes, plums, and apricots were abundant and a good crop of citrus fruits was picked. Apples and peaches were a smaller proportion of the total supply than in the previous year.

Vegetables.—Production, on a slightly increased acreage, amounted to about 352,200,000 bushels, as compared with 359,8000,000 bushels in 1929 and an average crop of 393,000,000 bushels during the five years 1924-1928. Despite the increase in the vegetable and truck-crop acreage, yields were so much lower than in 1929 that the supply of these perishables was not greater.

AGRICULTURAL INCOME FACTORS

Wheat.—Income from the year's wheat crop seemed likely to be considerably below that received from the previous crop. Farm prices through the first four months of the marketing season (July through October) averaged only about 71 cents a bushel, whereas in the corresponding months of the previous season the average was about 109 cents a bushel. Despite the short corn crop and the feeding of much wheat to livestock in the United States, prices declined to the lowest level since 1901 and 1902.

Cotton.—Developments in the cotton market continued to emphasize the importance of adjusting as far as possible the production of each quality of cotton to market requirements. The cotton crop in 1929 was the fifth largest in our history, and the area harvested was exceeded only in 1925 and 1926. Farmers who marketed their crop early received fairly good prices. From August to December, 1929, the prices paid to farmers for cotton ranged from about 18 cents to 16 cents a pound, or slightly less than the average for the previous season. Thereafter prices declined, and at the close of the marketing season were about 11 cents a pound, or on a level as low as that reached during the large crop year 1926-27. The downward movement of prices partly reflected reduced world consumption of American cotton.

Livestock.—The livestock situation was favorable at the beginning of 1930, but adverse conditions developed as the year advanced. Returns to livestock producers fell far below those of 1929. In the case of cattle and hogs, a decline in the demand was the principal difficulty. Cattle numbers in January were only slightly above the low point reached in 1928, and cattle slaughter seemed not likely to exceed that of the previous year. Hog production had been reduced and a marked reduction in hog slaughter was in prospect. Only in the sheep industry were there indications of over-expansion. Yet the prices for all three classes of livestock dropped greatly, the sheep industry suffering particularly because it had to deal with an increased production as well as with a reduced demand.

GRAIN EXPORTS AND IMPORTS

Exports of agricultural commodities in the year ended June 30, 1930, were the lowest since the year ended June 30, 1915. The export index number for the 12-month period was 97. This index is based on the exports of 44 of the principal farm commodities, with the movement in the period 1909-10 to 1913-14 taken as the base. The decline in the exports was general. With cotton (which bulks so large in the total) excluded from the reckoning, the index number for the remaining commodities was 117. This was lower than the corresponding number for any preceding similar 12-month period since 1913-14. The index for cotton calculated separately was 82, the lowest in six years. These figures reflect essentially the volume, not the value, of the exports, though values are considered in the weighing of the index. In value the agricultural exports of the United States were 19 per cent lower in 1929-30 than in 1928-29. Lower prices diminished the unit value of the goods exported, and increased world competition lessened the foreign demand for United States crops. Excluding forest products, our agricultural exports for the fiscal year 1929-30 were $1,495,000,000, against $1,847,000,000 in the previous year. Agricultural products constituted only 32 per cent of our total exports, as compared with an average of 40 per cent in the period 1925-29. The dominant factor in reducing the value of the exports was a smaller movement of cotton at a lower average price. There were also substantial decreases in the value of the exports of grains, fruits, animal oils, and fats, vegetable oilcake, and oilcake meal, and dairy products. Tobacco made the best showing. In quantity the tobacco exports increased notably and in value slightly. Exports of meat were higher in both volume and value. Lard exports were larger but the total value was less.

Imports of agricultural products also declined. The value of agricultural imports, excluding forest products and rubber, declined from $1,943,000,000 in the fiscal year ended June 30, 1929, to $1,696,000000 in the fiscal year ended June 30, 1930. The value of imports of all agricultural products, excluding forest products and rubber, was about the same as in 1924 and not so low as in 1922.

THE PROBLEM OF OVERPRODUCTION

Need of Crop Balancing.—One aspect of the farm problem overshadows all others. Production in a number of important lines is out of balance with the market, and surpluses pile up continuously. Barring such temporary fall in demand as we experienced in the past year due to world-wide business depression, our difficulty is not a sudden emergency, but a cumulative overproduction. Farm production, already above normal requirements, became disastrously excessive when the depression curtailed purchasing power. Exceptional weakness on the demand side was added to the trouble on the supply side. The answer to overproduction is less production. Crops must be balanced as nearly as possible with market demands and offered only in such quantities as can be sold at prices covering the farmers' cost of production plus a profit. If readjustment is not brought about by intelligent action, it will be affected through blind economic forces at excessive cost.

Technical Factors.—The growing efficiency of American agriculture helps to explain but does not justify its persistence in overproduction. Technical progress has increased farm productivity tremendously in the last 15 years, but the benefit has gone largely to the consumers. Farming has been industrialized and mechanized. It has used science, decreased its production costs, and increased its output, without finding either profit or security in the process. It has made two blades of grass grow where one grew before, only to find the second blade depressing the price of both. Continuing in this path, in the hope that still greater efficiency will eventually force our competitors out of the market, seems likely to work no better in the future than it has done in the past. Farming is becoming more efficient all over the world, and crop acreage and livestock breeding are increasing. The competing groups know that a halt in production will have to be called, but no group wishes to be the first to slow down.

The Wheat Situation.—It is sometimes urged in defense of continuous wheat expansion in the United States, that certain extensive wheat-growing areas in this country can produce wheat more cheaply than it can be produced anywhere else in the world. Whether or not this is entirely correct we do not know. Our methods and our machinery are up-to-date, but other countries are efficient too; and some of them have much cheap and fertile land. Even if our growers are in a relatively strong competitive position, it does not follow that they should blindly offer themselves for punishment. Competition to see who can stand the heaviest losses is irrational. Moreover, the number of relatively low-cost producers in this country is too great to justify an endurance contest among them. Their interest lies not in fighting among themselves but in combining to adjust their total output to market needs. In this task they can expect help from the Federal Government, but only if they approach it practically. By this time it is evident that supply-and-demand conditions cannot be set aside by legislation, that the dumping of surpluses abroad is not feasible, that the indefinite storing of surpluses tends to prevent rather than to cause a rise in prices, that tariff duties are not effective on commodities produced largely for export, and that subsidies would increase rather than restrain production. Voluntary curtailment of production is the only logical remedy for the surplus problem.

Importance of Acreage Adjustment.—It is not correct to say that the same result would be reached by leaving the curtailment to the free play of economic forces, as is often recommended. That course lacks scientific discrimination. It forces good land as well as poor into the discard, because it acts primarily on farmers instead of on acres. When a farmer is driven out of business, his whole farm suffers. Acreage readjustments collectively engineered have more precision in relocating production to economic advantage. This procedure, instead of throwing much valuable agricultural land blindly out of use, makes crop shifts that maintain the farm business as a going concern, while at the same time modifying its tendency to create surpluses. Comparatively small changes, on a sufficient number of farms, have in the aggregate a great beneficial effect. All that is necessary to set this constructive force in motion is team play. Farmers must recognize their common as well as their competitive interests.

FARM LANDS

Values.—Farm real-estate values, though not regionally uniform in the direction or the extent of their movement during the last year, continued downward, considering the country as a whole. Recessions in the year ended March 1, 1930, rounded out a decade of declines. The number of farms that changed hands through forced sales and related defaults in the 12-month period up to March 1, 1930, was high in relation to the number of voluntary transfers. Recovery in values was impeded by heavy taxation and by other factors, notably falling agricultural commodity prices.

Use of Land Resources.—How to make a better use of our land resources is a pressing problem. It would demand attention even if there were no crisis of overproduction. It is not simply a question of finding new uses for farm lands whose products cannot now be profitably sold, but of allocating various types of land to the most advantageous ends. In the United States we have a domain nearly 2,000,000,000 acres of which about 400,000,000 acres are classed as employed for cultivation. But if needed we could use nearly a billion acres for crop production. This is about half the total area of the Nation. In a general way our crops are grown in the areas to which they are best adapted; but a much better adjustment than that brought about by a trial and error is possible. Heretofore much land has been occupied in ignorance of better lands elsewhere, as well as of progress in agricultural technic, and is now unprofitable. Much land has been put into crops that should have been left in grass or forest. Large areas have been settled under conditions that invited failure. The time has come to correct some of the mistakes of the past and to take precautions against similar mistakes in the future.

Changes In Consumption.—A profitable agriculture, however, cannot be brought about merely by correction of past errors. It is becoming necessary to reshape the very foundations of the agricultural industry. Nothing less will accommodate it to the pressure of the powerful economic forces affecting supply and demand conditions. On the demand side, for instance, the displacement of work animals by power-driven machinery is removing the need for many million tons of corn, oats, and hay. Changes in diet are lessening the demand for certain products and increasing the demand for others. The American people are eating less bread, less corn meal, and less cereal foods per capita than they did 10 years ago. They are consuming more milk, more pork, more sugar, and possibly more fresh vegetables and more fruit. Export demand is narrowed by the recovery of European farm production from the effects of the war. Pre-war levels in production have been regained in most European countries and surpassed in some. Europe seeks greater self-sufficiency also through import restrictions. This year world-wide business depression has further weakened the agricultural markets.

New Factors In Production.—On the production side technical progress is bringing extensive semi-arid areas into cultivation not only in the United States but also in Russia, Canada, Australia, Argentina, and elsewhere. Labor-saving machinery is promoting the cultivation of the low-yield areas that formerly could not be profitably cultivated. American agriculture, always more economical of labor than of land, is pushing this principle to a new high level. Yet it has, of course, no monopoly on efficient farm technic. Production is outrunning consumption in most of the world. Argentina is now the leading corn-exporting country and has four times the corn acreage it had in 1900. Its exports of beef in 1929 were nearly a hundred times greater than ours. Exports of butter from New Zealand, Australia, and Argentina have increased sevenfold since 1900, and last year exceeded 350,000,000 pounds. Australia's wool production in 1929 was twice what it was in 1900. Russia is exporting wheat again. With a population only 20 per cent greater than that of 1900, the world's wheat and rye production is now something like 40 per cent greater and its production of corn, oats, and barley, taken together, about a third greater.

Proposed Remedies.—These conditions emphasize, though they do not create, the need for a rational land-utilization policy. Such a policy calls (1) for a scientific classification of our land resources, so that crop, pasture, and forest requirements may be more efficiently met. Knowledge of land resources is indispensable to the wise direction of production. (2) The contraction of farm acreage is necessary in some areas, and a check upon its expansion is necessary in others. (3) Steps should be taken by public agencies, local, state, or Federal, to divert tax-delinquent lands or lands obviously submarginal for farming purposes to other than farm uses. (4) Our national reclamation policy should be reconciled with the need of restricting farm production. (5) Public reforestation should be pushed. (6) Our public-domain policy should equally serve the interests of the local farming and grazing industry, the interests of agriculture as a whole, and the interests of the nation. (7) Information should be made available to guide private enterprise in land settlement.

AGRICULTURAL LEGISLATION

By Milton S. Eisenhower

Director of Information, Department of Agriculture

GENERAL

Outstanding among the Federal legislative enactments affecting agriculture in 1930 was the Hawley-Smoot tariff law. Other important enactments dealt with the foreign economic information service of the U. S. Department of Agriculture, the fruit and vegetable trade, plant patents, emergency loans to farmers, and the war against insect pests. Appropriations for highway construction were increased, with the double object of speeding the work and providing employment. The funds authorized for the fiscal year 1932 were apportioned on Sept. 1, 1930. Ordinarily this apportionment would not have been made until December, 1930. It was made earlier, and the apportioned funds became immediately available for allotment to new construction projects, so that employment might be furnished to farmers distressed by the drought and to other persons.

HAWLEY-SMOOT TARIFF LAW

Provisions. — The Hawley-Smoot tariff law, officially designated as the Tariff Act of 1930, provides for a substantial increase in the rates of duty on a large variety of farm products. It also provides for the continuance on the free list of many articles used by farmers and contains other provisions designed for their benefit, both as producers and as consumers. The law, which went into effect June 18, 1930, contains 15 dutiable commodity schedules, the free list, and special and administrative provisions.

Rates.—Measured in terms of the equivalent *ad valorem* rates, the average rate for the 15 schedules was increased from 33.22 per cent under the act of 1922 to 40 per cent under the act of 1930—an increase of 6.78 points or 20.41 per cent. The average rate for schedule 7, agricultural products and provisions, was increased from 19.86 to 33.62 per cent—an increase of 13.76 points in the equivalent *ad valorem* rate of duty, or 69.28 per cent. This is the largest increase in the average rate of duty, measured on the equivalent *ad valorem* basis, under any schedule in the Tariff Act. Increases in the equivalent *ad valorem* rate of duty on other important agricultural schedules are: Sugar, molasses, and manufacturers of (schedule 5), from 67.85 to 77.21 per cent—an increase of 9.36 points, or 13.80 per cent; tobacco and manufactures of (schedule 6), from 63.09 to 64.78 per cent—an increase of 1.69 points, or 2.68 per cent; wool and manufactures of (schedule 11), from

49.54 to 59.83 per cent—an increase of 10.29 points, or 20.77 per cent; spirits, wines, and other beverages (schedule 8), derived principally from agricultural products, from 36.48 to 47.44 per cent—an increase of 10.96 points, or 30.40 per cent. In addition are such products as cattle hides and leather, which have been transferred from the free list to schedule 15 (sundries).

Free List.—A large number and variety of articles of general consumption and use on the farm and elsewhere that were on the free list under the Tariff Act of 1922 are so continued in the act of 1930. These include agricultural implements and machinery, barbed wire, binding twine, fertilizer materials, sugar-beet seed, bananas, coffee, tea, wood shingles, and soft lumber planed on one side (when coming from Canada). Additions to the free list under the act of 1930 of articles and materials used by the farmer, or entering into the production of such articles or materials, include ammonium sulphate (fertilizer material), formerly dutiable at ¼ cent a pound; calcium arsenate, formerly dutiable at 25 per cent *ad valorem;* Paris green or London purple, formerly dutiable at 15 per cent *ad valorem;* urea (fertilizer material), formerly dutiable at 35 per cent *ad valorem;* baking soda, ¼ cent a pound; plantains, 35 per cent *ad valorem;* and unground spices, at various rates.

FOREIGN SERVICE LAW

Provisions.—Public No. 304, approved June 5, 1930, provides for the expansion of the foreign service of the Department of Agriculture. This measure directs the Secretary of Agriculture to (1) acquire information regarding world competition and demand in agricultural products; (2) investigate farm management and economic phases of agriculture in foreign countries; (3) demonstrate standards for cotton, wheat, and other American products; and (4) appoint representatives of the Bureau of Agricultural Economics as officers of the foreign agricultural service of the United States. These officers will be attached, through the Department of State, to the diplomatic missions of the United States, or to the consulates of the United States in the countries where they are stationed. The measure recognizes the increasing need of precise and extensive information about foreign agricultural conditions. Heretofore information about foreign crops and markets has been fragmentary and often inaccurate. Many governments do not report upon the agricultural activities of their countries. Others report the subject inadequately or in terms that are not satisfactory for comparative purposes. Supplementary field work by trained observers, as contemplated under the new law, should add much to the practical value of our foreign crop and market reports.

Importance of Enactment.—The Department of Agriculture spends annually more than $2,000,000 on domestic crop and livestock estimating, on price analysis, and on market news distribution. Similar work on foreign conditions is necessary to supplement the domestic information. Farm-commodity prices within the United States often depend as much on conditions abroad as on conditions at home, and an economic information service that does not broadly cover foreign conditions obviously cannot fully answer its purposes. American farmers cannot adjust their production intelligently to market requirements if they are in the dark about foreign demand and foreign competition.

FRUIT AND VEGETABLE REGULATION

Purposes.—Public No. 325, approved June 10, 1930, providing for the regulation of the trade in fresh fruits and vegetables. This law, designed to suppress unfair and fraudulent practices, prohibits fraudulent charges, improper rejections, failures to deliver, discarding or dumping of products without reasonable cause, false reporting about shipments, failure to account correctly for shipments, misrepresentations as to the origin of shipments, and the removing or altering of tags representing Federal inspection. It provides for the licensing of commission merchants, dealers, and brokers, and authorizes the Secretary of Agriculture to reject or revoke licenses for violation of the act. It also gives the Secretary authority to order the payment of reparations to injured parties. Civil suits may be entered in the courts to compel the fulfillment of such orders.

Inspection Service.—The act gives permanent authority for the Federal fruit and vegetable inspection service. All branches of the fruit and vegetable trade, as well as organizations representing the producers, indorsed the principles of this legislation. The Food Administration during the World War period required all handlers of fruits and vegetables to take out licenses; the results of this system were generally satisfactory. It lapsed, however, with the return of peace. Shippers and others have urged its restoration through permanent legislation. Both shippers and receivers of fruits and vegetables have sought protection against unethical practices and against difficulties created by the lack of uniform methods for the settlement of disputes. These requests became so insistent that many bills designed to meet them were proposed before the present one was adopted. Though it has been in operation only a few months, it has done much good already. Notably it is causing some formerly haphazard phases of the fruit and vegetable industry to be brought under contractual relationships. Incomplete and indefinite contracts are a common cause of miusnderstanding between shippers and receivers of fresh fruits and vegetables. Cooperative associations, as well as private merchants, dealers, and brokers, are required to take out licenses. Individual producers, however, are not obliged to do so if they sell only produce of their own raising. A person buying produce solely for sale at retail is not considered a dealer within the meaning of the act, unless his annual purchases exceed 20 carloads. These are the only exceptions to the operation of the measure in interstate and foreign commerce. Essentially all that the act requires of the licensee is square dealing and proper records. It will not interfere with the proper conduct of his business, but will make it less hazardous by reducing the frequency of disputes.

PLANT PATENTS

Public No. 245, approved May 23, 1930, provided for plant patents. This law amends Sections 4884 and 4886 of the revised statutes so as to bring within the patent laws discoveries of asexually reproduced plants which are new and distinct varieties, other than tuber-propagated plants, not known or used by others in this country before discovery and not patented or described in any printed publication in this or any foreign country before discovery, or more than two years prior to application for patent, and not in public use or on sale in this country for more than two years prior to applications for patent. The measure authorizes the President to direct the Secretary of Agriculture to furnish the Commissioner of Patents information necessary to administering the plant-patent laws. It further authorizes the President to direct the Secretary to conduct research on special problems, or to detail to the Commissioner of Patents such members of the Department as the Commissioner may request, for the purpose of carrying the act into effect. The act is not retroactive.

DEPARTMENTAL APPROPRIATIONS

Public No. 272, approved May 27, 1930, making appropriations for the Department of Agriculture. Funds made available by this act bring the total appropriation for the Department up to $174,000,000 for the fiscal year 1931. This includes $89,000,000 for roads. The $85,000,000 remaining includes approximately $7,000,000 in excess of 1930 working funds for extending the activities of the department. An increase of more than $1,500,000 is provided for research. Federal expenditure for agricultural research is thereby increased to more than $20,000,000 annually, including more than $4,000,000 in payments to the states for support of the State Agricultural Experiment Stations. An increase of more than $1,000,000 is provided for additional extension work (principally in marketing) in coöperation with the several states. Federal funds for extension now total nearly $11,000,000 annually. An increase of about $2,500,000 is provided for forestry work, particularly fire protection. Increases totaling $600,000, making $1,400,000 in all for this purpose, are provided for meteorological work in the interest of aviation. The remainder of the $7,000,000 is allocated to extend and improve the service and regulatory activities of the department.

OTHER LEGISLATIVE ENACTMENTS

Drought and Flood Relief.—Public No. 78, approved March 26, 1930, providing, among other things, $6,000,000 for loans to farmers in the storm, flood, or drought stricken areas of Alabama, Florida and Georgia, North Carolina, South Carolina, Virginia, Ohio, Oklahoma, Indiana, Illinois, Minnesota, North Dakota, Montana, New Mexico, and Missouri, for the purchase of feed, seed and fertilizer. The same act appropriated $1,660,000 for the relief of the State of Alabama for damage to and destruction of roads and bridges by floods in 1929.

Road Appropriations.—Public No. 90, approved April 4, 1930, authorizing additional Federal-aid road appropriations. This measure authorizes appropriations of $50,000,000 (in addition to the $75,000,000 provided by the Agricultural Appropriation Act for 1931) for the fiscal year 1931, and $125,000,000 each for the fiscal years 1932 and 1933 for the construction of Federal-aid highways. It increases from $15,000 to $25,000 the limitation on the per mile cost of Federal-aid roads exclusive of the cost of bridges of more than 20 feet clear span. This provision is qualified to limit Federal participation to $15,000 a mile until the original certified 7 per cent syste min a given state shall be surfaced.

Forest Products Laboratory.—Public No. 128, approved April 15, 1930, authorizing the acceptance of a donation of land from the University of Wisconsin as a site for a new Forest Products Laboratory at Madison, Wis., and authorizing an appropriation of $900,000 for the construction of a building or buildings suitable for such laboratory, with necessary equipment.

Loans to Farmers.—Public Resolution No. 47, approved March 3, 1930, authorizing an appropriation of $7,000,000 to enable the Secretary of Agriculture to make loans for feed, seed, and fertilizers to farmers in storm, flood, or drought-stricken areas of Alabama, Florida, Georgia, North Carolina, South Carolina, Virginia, Ohio, Oklahoma, Indiana, Illinois, Minnesota, North Dakota, Montana, New Mexico, and Missouri. The amount actually provided for this purpose by the First Deficiency Act for 1930 was $6,000,000.

Mediterranean Fruit Fly.—Public Resolution No. 29, approved December 21, 1929, appropriating funds for the eradication of the Mediterranean fruit fly. Under this resolution $1,290,000 was appropriated to be available until June 30, 1930, for the control and eradication of the Mediterranean fruit fly. It gave the Secretary of Agriculture discretion to make no expenditures out of the appropriation until a sum or sums adequate to state coöperation had been appropriated, subscribed, or contributed by state, county, or local authorities, or by individuals or corporations.

Bollworm Appropriation.—Public Resolution No. 42, approved February 8, 1930, authorizing an appropriation of $2,500,000 for full compensation to farmers for actual and necessary losses sustained to the crop of 1930 on account of enforced nonproduction of cotton as a means for the control of the pink bollworm, on condition that the states concerned make satisfactory guarantees for reimbursement of one-half of the Federal expenditures.

GRAIN AND COTTON GROPS

BY W. F. CALLANDER

CHAIRMAN, CROP REPORTING BOARD, DEPARTMENT OF AGRICULTURE

COTTON

Production and Value.—Cotton production in the United States in 1930 was about 3.9 per cent smaller than the 1929 crop and about 5 per cent less than the average production of the five years 1924-1928. The value of lint cotton and cottonseed of the 1930 crop was $811,000,000 or 43 per cent less than the value in 1929 of $1,418,000,000. The greater part of the 43 per cent decline in total value was due to the much lower prices paid producers for the 1930 crop. The average farm price of cotton lint on Dec. 1, 1930 was 9.5 cents per pound, compared with 16.4 cents per pound on Dec. 1, 1929. Cottonseed prices to producers on Dec. 1, 1930, averaged $21.62 per ton as compared with $30.33 on Dec. 1, 1929. The total value of cotton, cottonseed and grain crops for 1930 was about $3,440,000,000 or approximately 34 per cent less than the 1929 combined evaluation of $5,213,000,000.

Total Crop and Ginnings.—In the Crop Reporting Board's cotton report of Dec. 8, cotton production in the United States was estimated at 14,243,000 bales of 500 pounds gross weight, 585,000 bales less than the total ginnings of the 1929 crop, and 785,000 bales less than the five-year average production from 1924 to 1928.

Cotton Acreage.—The acreage of cotton harvested in 1930 was 45,218,000 acres. This was a dcrease of a little more than 1 per cent from the 45,793,000 acres harvested in 1929. The greatest decrease occurred in North Carolina and California where the acreage was about 13 per cent below that of 1929. A reduction of about 3 per cent took place in Texas, 5 per cent in Oklahoma, 6 per cent in Arizona and about 1 per cent in South Carolina, Louisiana and New Mexico. There was an increase in cotton acreage of about 8 per cent in Missouri and Tennessee, 10 per cent in Florida, 4 per cent in Georgia, 3 per cent in Alabama, 2 per cent in Mississippi and 1 per cent in Arkansas. The abandonment in cotton acreage after July 1 was 2.1 per cent in 1930. This was somewhat less than the 2.7 per cent that occurred between July 1 and harvest in 1929.

Cotton Yield by States.—The estimated average yield per acre of cotton (lint) was 150.8 pounds in 1930. This was somewhat lower than the yield in 1929 when 155 pounds of cotton was produced, and lower than the ten-year average yield of about 155 pounds per acre. Yields per acre of cotton in 1930 were higher than in 1929 and also higher than the ten-year average (1919-1928) in South Carolina, Georgia, Florida, Alabama, New Mexico, Arizona and California. Yields in 1930 were higher than in 1929, but not as high as the 10-year average in North Carolina and Texas. The estimated production of cotton in 1930 was larger than in 1929 in the Carolinas, Georgia, Florida, Alabama, Texas, New Mexico and Arizona. Production was lower than in 1929 in the states most seriously affected by the drought of last summer,—Virginia, Missouri, Arkansas, Tennessee, Oklahoma, Mississippi and Louisiana. The estimated production of cotton in the more important cotton producing States in 1930 was as follows: Texas, 4,100,000 bales; Georgia, 1,625,000; Mississippi, 1,500,000; Alabama, 1,495,000; South Carolina, 1,040,000; Arkansas, 910,000; Oklahoma, 900,000; North Carolina, 795,000; Louisiana, 710,000; Tennessee, 400,000; California, 250,000; Arizona, 160,000; Missouri, 160,000; New Mexico, 100,000; Florida, 50,000, and Virginia, 42,000 bales. In 1929 the final revised estimate of cotton production based on ginning reports was as follows: Texas, 3,940,000 bales; Mississippi, 1,915,000; Arkansas, 1,435,000; Georgia, 1,343,000; Alabama, 1,342,000; Oklahoma, 1,143,000; South Carolina, 830,000; California, 260,000; Missouri, 220,000; Arizona, 153,000; New Mexico, 90,000; Virginia, 48,000, and Florida, 29,000 bales.

WHEAT

Acreage, Yield and Prices.—Although wheat farmers harvested 3.8 per cent less acreage in 1930 than in 1929 they secured a relatively high yield per acre and produced a total wheat crop of 851,000,000 bushels. This was 5.2 per cent larger than the 1929 crop of 809,000,000 bushels and 2 per cent more than the 5-year average (1924-1928) production of 834,000,000 bushels. The total area of all wheat harvested was 59,153,000 acres as compared to 61,464,000 acres in 1929. Yields averaged 14.4 bushels per acre in 1930 and 13.2 bushels per acre in 1929. For the preceding ten years (1919-1928) the average yield secured was 14.1 bushels. On the basis of the Dec. 1 farm price the total value of the 1930 wheat crop was $517,000,000. The value of the 1929 crop was $843,000,000. The Dec. 1 farm price of 61 cents per bushel was the lowest price reported on this date since 1899. Dec. 1 wheat prices were 41.5 per cent lower than the average price of 104 cents per bushel received on December 1, 1929.

Winter Wheat.—The harvested acreage of the winter wheat crop was about 4 per cent smaller than that of 1929, as a result of a heavier abandonment in 1930. However, yields per acre in 1930 average 15.7 bushels compared with 14.4 bushels in 1929. This resulted in a harvest of 604,000,000 bushels from 38,608,000 acres in 1930 as compared to a 576,000,000 bushel crop from 40,059,000 acres in 1929. The 5-year average production is 551,000,000 bushels and the 10-year average yield per acre 15 bushels. The total farm value of the 1930 winter wheat crop on the basis of Dec. 1 farm prices was $389,000,000 as compared with $614,000,000 for the 1929 crop and $599,000,000 for the crop of 1928. Prices paid farmers on Dec. 1, 1930 averaged 64 cents per bushel. The Dec. 1 farm price was $1.06 in 1929.

Durum Wheat.—The production of 56,000,000 bushels of durum wheat in the four important producing states in 1930 compares with 54,000,000 bushels harvested in 1929. Production in both years was materially below the 5-year average production of 69,000,000 bushels. The area harvested in 1930, while about 16 per cent smaller than in 1929, returned an average yield of 12 bushels per acre or about 22 per cent larger than the relatively low yield of 9.8 bushels in 1929. The 10-year average yield was 12.3 bushels. The Dakotas produce the bulk of the durum wheat crop and accounted for 52,000,000 bushels of the 1930 total as compared with their 1929 production of approximately 51,000,000 bushels. The farm price Dec. 1, 1930 was much lower than that of spring wheat or winter wheat, averaging 45 cents per bushel. On Dec. 1, 1929, the average price was 88 cents. Consequently, the total value of the durum crop declined from $48,000,000 in 1929 to $25,000,000 in 1930.

Other Spring Wheat.—The production of spring wheat other than durum increased about 7 per cent from 1929 while the value of the crop was about 43 per cent less. Production in 1930 was estimated at 191,000,000 bushels as compared with 179,000,000 bushels produced in 1929 and a 5-year average harvest of 214,000,000. The area harvested in 1930, amounting to 15,902,000 acres, was only slightly more than the 15,880,000 acres harvested in 1929. The average yield increased to 12 bushels per acre in 1930 from 11.3 bushels in 1929. Dec. 1 farm prices averaged 54 cents in 1930 as compared to 102 cents a year earlier. The total farm value of the 1930 crop, as based on the Dec. 1 price was $104,000,000 as compared with $182,000,000 for the smaller 1929 crop.

CORN

Crop Condition.—The corn crop made a good start in May and June and early July over most of the country. By the middle to the last of July a lack of soil moisture combined with little, if any, precipitation began to be reflected in the appearance of the corn crop. During August the worst drought in nearly 30 years checked the growth of corn and curtailed production, especially in the lower valley of the Mississippi River, and in the Ohio and Potomac Valleys. Consequently the corn crop in 1930 was the smallest in nearly 30 years. Scattered showers during July and August resulted in a great variation in yields even within localities in the 12 North Central States. Corn yields were well maintained in Nebraska, Wisconsin and North Dakota, whereas in Missouri and Southern Illinois, Indiana, Ohio, and in Kentucky, Tennessee, and Arkansas, the production of corn was reduced drastically by the drought.

Production. — The production of corn for all purposes was about 2,081,000,000 bushels in 1930, which was approximately 20 per cent below the production of 2,614,000,000 bushels in 1929, 26 per cent less than the 1928 harvest, and 23 per cent below the average production of 2,700,000,000 bushels from 1924 to 1928. The area of corn grown for all purposes in 1930 was 100,829,000 acres, an increase of 3 per cent over the average produced in 1929 and nearly 1 per cent above the average corn acreage during the preceding 5 yars. Yield per acre was 20.6 bushels as compared with 26.7 in 1929, and the 10-year average of 28.2 bushels. Dec. 1 farm price of corn for grain was 66 cents per bushel as compared with 78 cents a year earlier. Although the value of the corn crop is dependent upon the average price received by producers throughout the entire marketing season beginning Nov. 1, Dec. 1 prices give a rough index of changes in value when applied to the total production. Applying these prices to the 1930 production for all purposes, the farm value of the crop is indicated to be about $1,379,000,000 as compared with an evaluation of $2,043,000,000 for the 1929 crop. There was a considerable shift in the distribution of the 1930 corn crop as compared with 1929 due largely to the drought which was exceptionally severe in some areas. The 1930 corn crop in the South Central States was about 34 per cent smaller than in 1929, in the South Atlantic States, 23 per cent smaller; in the North Atlantic States, 22 per cent; in the East North Central States, 20 per cent; and in the West North Central States, 17 per cent smaller. Production in the Far West was approximately 32 per cent larger than in 1929.

OTHER FEED GRAINS

Oats.—The total oat crop was 1,402,000,000 bushels in 1930 as compared with 1,228,000,000 bushels in 1929 and an average of 1,372,000,000 bushels during the preceding 5 years. In most states the crop was too far advanced to be seriously injured by the drought and the yield per acre averaged 33.7 bushels, 10 per cent higher than in 1929 and 9 per cent higher than the average yield for the preceding ten years. Although a larger acreage was cut for hay in the drought area than in any recent year, an area of 41,598,000 acres was harvested for grain, an increase of 4 per cent over the 40,043,000 acres harvested for grain in 1929. Dec. 1 price of 32.4 cents per bushel indicated a farm value of $454,000,000 for the harvested crop. Calculated at 43.5 cents per bushel, the 1929 crop was worth $534,000,000.

Barley.—The total production of 326,000,000 bushels of barley in 1930 was the largest on record except that of 1928 which was estimated at 357,000,000 bushels. Approximately 303,000,000 bushels were produced in 1929, while the average production was only 241,000,000 bushels for the 5 years immediately preceding. The acreage of barley in 1930, while slightly below that of 1928 and 1929, was greater than in any previous year. About 12,437,000 acres were harvested in 1930, 13,068,000 acres a year earlier, and 12,598,000 acres in 1928. The yield for the entire country in 1930 was 26.3 bushels, 3.0 bushels per acre higher than a year earlier, and 1.2 bushels higher than the average for the preceding 10 years. The 1930 crop was evaluated at $129,000,000 on the basis of a Dec. 1 average price of 40 cents per bushel. On the same date a year earlier, barley sold for 55 cents a bushel, and the 1929 crop was estimated to be worth $167,000,000. The 1930 crop, larger by nearly 8 per cent, had approximately 23 per cent less value.

Grain Sorghums.—The production of kafir, milo, feterita and other grain sorghums for all purposes was equivalent to 86,622,000 bushels in 1930, 14 per cent smaller than the 100,845,000 bushels produced in 1929, and 32 per cent below the 5-year average production of 128,000,000 bushels. The area harvested in 1930 amounted to 6,180,000 acres, an increase of 4.5 per cent over the 5,921,000 acres grown in 1929. A decline of about 18 per cent in the yield per acre as compared to 1929 contributed to the sharp decrease in production. The farm price on Dec. 1 was 64 cents per bushel as compared with 71 cents a year earlier. Applying these prices to the total production, gives a value of $55,486,000 for the 1930 crop and $71,617,000 for the 1929 crop.

OTHER CEREAL GRAINS

Rye.—Production for 1930 was 50,000,000 bushels, which is an increase of 8,000,000 bushels, or 19 per cent over the very low production of 1929, but about 1,000,000 bushels, or 1.5 per cent below the average production during the preceding 5 years. Rye acreage for grain in 1930 exceeded that of the previous year by nearly 12 per cent. The yield per acre was also better than in the previous year, being 13.5 as compared with 12.6 bushels in 1929. The Dec. 1 farm price was 42 cents per bushel in 1930 and 86 cents a year earlier. In consequence, the 1930 crop value of $21,000,000 was the lowest for any year since 1906, and $15,000,000 less than the value of the 1929 crop.

Buckwheat.—The total production of buckwheat in 1930 was the smallest since 1883. It amounted to only 8,975,000 bushels as compared to 11,474,000 bushels in 1929 and an average production of 13,800,000 bushels during the preceding five years. The summer drought was disastrous to buckwheat. The yield of 13.6 bushels per acre was the smallest in 42 years and compared with 15.7 bushels in 1929, and an average of 19.0 bushels for the preceding ten years. Dry weather made it possible to plant only a relatively small area and part of this was abandoned. Only 658,000 acres were harvested as compared to 729,000 acres in 1929 and an average area of 749,000 acres during the preceding 5 years. Notwithstanding this extreme shortage, buckwheat sold for only 84 cents per bushel on Dec. 1, 1930, which was considerably less than the price of 98 cents a year earlier. The farm value of the 1930

GRAIN AND COTTON PRODUCTION IN THE UNITED STATES, 1930
(Million bushels)

Crops	1930	1929	Five-Year Average 1924–1928
Corn [1]	2,081	2,614	2,700
All Wheat	851	809	834
Winter Wheat	604	576	551
Durum Wheat [2]	56	54	69
Other Spring Wheat	191	179	214
Oats	1,402	1,228	1,372
Barley	326	303	241
Grain Sorghums	87	101	128
Rye	50	42	51
Rice	41	40	39
Flaxseed	24	17	24
Buckwheat	9	11	14
Cotton lint (1,000 bales)	14,243	14,828	15,028
Cottonseed (1,000 tons)	6,328	6,590	6,675

[1] Grain equivalent of corn produced for all purposes, including hogged and siloed corn, and that cut and fed without removing the ears, as well as that husked and snapped for grain.

[2] Four states only—North Dakota, South Dakota, Minnesota and Montana.

crop was $7,600,000 and the value of 1929 production, $11,200,000.

Rice.—The total crop of 41,367,000 bushels produced in 5 states in 1930 was about 900,000 bushels greater than the 1929 crop, and approximately 2,400,000 bushels more than average production during the preceding four years. The increase over 1929 was accounted for by the million bushel increase in production of Japanese varieties of rice in California. An increase of 1,000,000 bushels in Texas was offset by a corresponding decrease in Louisiana. The yield of 43.1 bushels, though below the 46.6 bushel yield of 1929 was above the 10-year average of 40.3 bushels. Rice acreage was increased about 11 per cent in 1930 with a total harvested area of 960,000 acres. About 868,000 acres were harvested in 1929. Dec. 1, 1930 prices of rice averaged 76 cents per bushel, while a year earlier, rice returned an average of 98 cents. The total value of the 1930 crop was $31,600,000 and the value of the 1929 crop $39,500,000.

FLAXSEED

The 1930 crop of flaxseed amounted to 24,000,000 bushels as compared to 17,000,000 bushels a year earlier. Production, while about the same as the average harvest during the period 1924-1928, was larger than in 1929 due to an increase of about 30 per cent in the 1930 harvested acreage. 3,946,000 acres were harvested in 1930 as against 3,050,000 in 1929. Although drought resulted in considerable abandonment of flax average in parts of the Dakotas and Montana, it was not quite as damaging to yields as in 1929. This is indicated by an average of 6 bushels in 1930 as compared with 5.6 bushels per acre a year earlier. The large 1930 crop will not return flax producers as much money as the smaller harvest of 1929. Dec. 1, 1930, farm price was $1.40 per bushel as compared with $2.84 in December, 1929. Total value of the crop was but $33,000,000 as compared to $48,000,000, the value of the 1929 crop.

LIVESTOCK AND MEATS

By E. W. Sheets

Chief, Animal Husbandry Division, Department of Agriculture

EFFECT OF THE DROUGHT

Feed.—The year 1930 in American livestock affairs has been dominated by the drought. Corn, the great stock feed, was drought-burned to the extent of a full fourth of the crop, leaving a harvest of around 2,000,000,000 bushels, the smallest in a generation. In 1901, the last serious drought year, corn yielded 17 bushels to the acre. This year the forecast is for about 19 bushels per acre as against an average of 28 bushels. In addition an immeasurable wealth of grass—the stockman's cheapest feed—and nearly a fifth of the hay crop was burned by the drought. In addition to early fall feeding necessitated by poor pastures and short hay crops, American farmers are entering the winter with the smallest supply of the three principal feed grains, on record—91,000,000 tons of corn, oats and barley, as against a 5-year average of 110,000,000 tons.

For the same reason that drought in this country can never be a cause of famine, it always becomes a serious problem of livestock feeding and management. Ninety per cent of the feed eaten by our domestic stock, including poultry, is furnished by corn, hay and pasture—the three crops which suffered most during the disastrous drought of 1930.

The Human Diet.—Because of the character of our diet, drought can never be a direct human food problem in the United States. If we depended chiefly upon cereals grown at home for food, we should now be facing a famine, with a shortage in the national corn bin of enough grain to nourish for a year nearly half of our population. But we eat less than one-tenth of our corn crop as corn. Something like 85 per cent of it we consume as steaks, chops, roasts, eggs and dairy products. Each of us eats each year more than half a ton of corn in the form of meats, eggs and dairy products, and but 45 pounds of it as corn. The American system of farming, based upon livestock production, coupled with our balanced diet, constitutes therefore a great and a flexible bulwark against disaster from drought.

FARM RELIEF MEASURES

Freight Rates.—Great praise is due the railroads for their contribution toward the relief of suffering stockmen. More than 60,000 carloads of feed were moved into emergency areas at reduced rates up to November 30, when the privilege expired. It is said to be the largest tonnage ever moved on any relief measure undertaken in this country. The savings to farmers effected by the lowered freight rates, estimated from reports submitted by 760 out of the 1,016 counties where the special tariff has been in force, are shown in the following table:

FREIGHT RATE SAVINGS TO FARMERS

State	Counties Involved	Counties Reporting	Total Carloads	Estimated Savings to Farmers
	Number	Number	Number	
Alabama	39	28	164	$ 5,589.50
Arkansas	75	73	967	19,990.24
Georgia	7	1	26	563.75
Illinois	40	27	163	3,642.02
Indiana	41	35	1,337	41,802.50
Kentucky	117	97	3,892	153,438.99
Louisiana	40	24	291	5,904.50
Maryland	21	21	2,575	162,501.34
Mississippi	73	46	1,181	31,333.00
Missouri	78	70	1,227	27,114.47
Montana	28	22	436	21,591.67
New Mexico	5	2	110	5,850.00
North Carolina	8	3	98	6,934.04
Ohio	60	53	4,687	133,828.00
Oklahoma	60	23	255	6,925.79
Pennsylvania	8	7	616	33,837.00
Tennessee	79	52	1,980	55,834,83
Texas	82	51	1,928	42,922.46
Virginia	100	78	6,107	371,456.50
West Virginia	50	42	2,951	130,687.30
Wyoming	5	5	67	6,414.24
Total	1,016	760	31,058	$1,268,162.14

Feeding and Conservation.—Stockmen are preparing to feed large quantities of wheat and other small grains as a substitute for part or most of the corn in their rations; and they are storing and conserving greater quantities of fodder, straws and stovers, as well as cheap hays, than ever before. A survey in Ohio indicates that about 550,000 tons of hay will have to be brought into the state in order to carry that state's livestock through the winter, notwithstanding that Ohio farmers will feed about a third fewer beef cattle, 3 per cent fewer dairy cattle, 9 per cent fewer sheep, and 20 per cent fewer hogs than last winter. And Kansas, with a corn crop of nearly 70 per cent as large as last year, is harvesting two-thirds of its crop in but 30 of its 105 counties, and these 30 counties are ones where beef cattle are comparatively few.

Corn Belt Situation.—Reports indicate that decidedly fewer cattle will be fed throughout the fall and winter, 1930-31, than last year, in the Corn Belt. Shipments of stocker and feeder cattle into the 11 central states during July-September this past summer were 25 per cent smaller than last year, 30 per cent below the 5-year average, and much the smallest in 12 years. This seems to indicate fewer grain-finished cattle coming to market this winter.

LIVESTOCK PRODUCTION AND PRICES

Price Averages.—The average prices paid by packers during the first eight months of 1930 were lower than those in the corresponding period of 1929 by 8.2 per cent on hogs, 16.9 per cent on cattle, 20.2 per cent on calves, and 30.5 per cent on sheep and lambs.

Meat Output.—Total meat production under Federally inspected slaughter, for the first eight months of the year, was 4.3 per cent smaller than last year. This was chiefly due to the decrease of 7.6 per cent in pork slaughter, while 18.1 per cent more lamb and mutton were slaughtered, and beef just about held its own. One of the bright spots in the livestock market, as this is written, is the recuperative power being shown by the lamb market which at the end of the summer had descended to the lowest levels recorded since the prewar period. Dressed lamb is moving into consumptive channels freely at the comparatively bargain prices which are current.

Eggs and Poultry.—As the year nears its close the egg and poultry markets find themselves with considerable storage supplies on hand, but with a very satisfactory increase taking place in consumption of those products accompanied by the generally declining prices. The dry, hot season was a good one for turkeys, so that, strangely enough, the sections of the country worst hit by drought, namely the East Central States, will market about 10 per cent more turkeys this year to nearly offset a decrease in the production of the range states.

LIVESTOCK RESEARCH

Livestock research during the year continued to show highly satisfactory progress, with more and more emphasis being placed upon accurate measures of performance at the producer and of the livestock business, and of quality in the finished product. If anything, accuracy and intelligence in measuring quality in meats, eggs and animal fibers,—the ability of these products, in other words, to meet exactly the varying and changing demands of consumers,—is of the first importance. Without such measures, records of performance of especially prepotent or valuable animals are not convincing. With them, animal husbandry research can proceed to locate and perpetuate valuable breeding types and individuals with the assurance that comes from knowing that one is producing a quality of product exactly in line with consumer demand. The Department of Agriculture in coöperation with some 25 state agricultural experiment stations is focusing the major part of its livestock research toward these two projects, which are in reality companion projects with one goal. One is to learn the factors responsible for quality in meats, factors of breeding, feeding, management; processing and cooking of the finished product. The other is to aid breeders and their organizations in locating and perpetuating the most efficient strains of animals, based upon a high-quality product, and compatible with the practical requirement that all livestock must be the great balancers in American agriculture, a bulwark against drought disaster, against soil depletion, and against agricultural waste.

DAIRYING

By L. R. Ender

Bureau of Dairy Industry, Department of Agriculture

GENERAL

The year 1930 was a difficult one for the dairy industry, but the industry probably came to the end of the year in a much better condition than many other industries. Price and demand in dairy products held fairly stable from the end of the War up until about a year ago, but in the last year or so the dairy industry has been forced to readjust itself to a new and lower price level.

MARKET CONDITIONS

Overproduction of Milk.—The consumption of milk and other dairy products declined somewhat. Statistics for the nation as a whole have not yet been received and tabulated. The general economic depression cut down the buying power of the average consumer, and this was a factor in the drop in consumption. Another factor is that the comparatively favorable situation of the dairy industry attracted new people into the business of milk production, and also encouraged people established in the industry to increase output. As a result of diminished buying power of the consumer and abnormal increase in the production of milk, the markets for dairy products were at the close of the year in a disturbed, oversupplied, and unsettled condition. In addition, reports received up to the end of the year by the Department of Agriculture from the principal dairy regions of the country, indicated that production might be still further increased because of an apparent tendency of dairy farmers to carry over a larger proportion of their young cows for milking purposes without a proportionate culling of low-producing cows from their herds. The leaders of the dairy industry therefore have warned the farm producer against producing more milk than the markets can take to advantage. Another of the big factors in the increasing production of milk has been that feed prices have been relatively low, which seems anomalous in view of the expectation that the summer drought of 1930 would make feeds scarce and high in price.

Butter.—At the beginning of the present feeding season it was reported from various parts of the country that there was a tendency toward an increase in the production of creamery butter. According to estimates, the production of butter in August of this year was about 12 per cent less than for August, 1929, but the monthly production since last August, as compared with the corresponding months of 1929, increased month by month until at the end of the year it appeared that the December production might exceed the production of December, 1929.

DAIRY EXPORTS AND IMPORTS

Until recent years the American dairy industry has been upon an almost entirely domestic basis; that is, we have been exporting little and importing little. Import volume has been equivalent to only about 1 per cent of our consumption. These imports have been largely in the form of cheese, of kinds and qualities which we do not yet produce and market successfully enough to enable us to compete with the foreign articles. At the close of 1930 there seemed to be little or no prospect of any increase in either exports or imports. There was a time, late in the year, when it seemed that our new 14-cent butter tariff might not keep considerable supplies of butter from coming in from New Zealand, but prices for the domestic product went into further decline and this threat of imports disappeared, at least for the time being.

TRENDS IN DAIRY INDUSTRY

Development of Farm Efficiency.—The leaders of the dairy industry consider that the long-time trends indicate a sound and substantial progress for the industry, both on the farm and the manufacturing and distributing phase. There is a distinct trend toward greater efficiency and economy in production of milk on the farm. In 1850, it is estimated, the average production of milk per cow in the United States was about 1,436 pounds, whereas in 1927, the latest year for which estimates are available, it was somewhere in the neighborhood of 4,600 pounds. In 1850 we maintained about 278 milk cows per thousand people of our population, and in 1927 we maintained only 186 per thousand, yet at the same time our per capita consumption of dairy products has been steadily increasing. The latest census figures available show that we now have a total of about 22,500,000 milk cows in the United States.

Dairy Herd Improvement.—Dairy Herd-Improvement Associations, which are organizations of progressive dairymen in local communities, are accomplishing some very important results, not only on behalf of the farm producer himself, but also the consumer who buys dairy products. The purpose of these associations is to help the farmer to increase the production efficiency of his herd, through record keeping, better feeding, better breeding, and better management of his cattle. More than 500,000 of the dairy cows in the United States are now represented in these associations which number about 1,150. The total number of associations and number of cattle in these associations are increasing steadily through the efforts of the extension services of the various states colleges of agriculture and the U. S. Department of Agriculture. According to the latest figures on these associations, the average production of milk per cow in the association is 7,451 pounds of milk, or 296 pounds butterfat, the production of which is about 60 per cent higher than the average for all the dairy cows in the United States.

Coöperative Marketing. — Great strides are being made by dairy farmers in the marketing of their products, not only in the technical and mechanical features of distribution, but also in respect to the bacteriological, chemical, and other quality aspects of these products. In the last decade there has been a tremendous growth in the coöperative marketing of dairy products. Butter and cheese associations were the first coöperative organizations of producers to be organized. Later on came the organization of producers of market milk, and today practically every important milk-shed in the United States is organized or in process of being organized. With the growth of the producers' coöperative movement there came a development of better business methods on the part of the coöperatives, and today we find the commercial distributors in the city not only willing to do business with the producers associations, where they are well managed and where they do business in a businesslike way but glad to do so, because it stabilizes their operations and they are able to get a higher quality of product.

Refrigeration and Transportation.—The great advances that have been made in the development of refrigeration and transportation in the last few years are of great importance to the dairy industry. This development has greatly enlarged the area from which our large cities can draw their milk supplies, and has made possible the establishment of profitable dairy farming in remote parts of the country where dairying could not exist before on any large commercial scale.

Dairy Growth in the South.—One of the most important trends has to do with the growth of dairying and dairy manufacture in the South. The ravages of the cotton boll weevil, the need for restoring fertility to the soil by the growing of leguminous crops, and the consequent need for livestock to consume these crops, the interest which the dairy manufacturing industries have taken in the South as a comparatively cheap source of milk and cream, the industrial growth of southern cities, and the favorable conditions provided by nature, are factors responsible for a great growth of the dairy industry in the South in recent years.

Dairy Machinery.—There has been a tremendous increase in the use of machinery throughout the dairy industry, and in no branch is this more marked than on the farm. As a striking example of this, the scientist and the engineer have developed milking equipment which successfully milks 1,600 cows three times a day with an enormous saving in man labor and other costs. Great quantities of machinery of various kinds are used throughout the industry, on the farm and in the manufacturing plants. The manufacture of dairy machinery is itself a large industry.

Quality Improvement.—The general rise in quality of all kinds of dairy products represents one of the most important trends. In the last quarter of a century there has been a vast improvement in the average quality of the nation's milk due to the coöperation of the industry with public health and inspection authorities, and to the development of machinery, equipment, and methods of milking and handling milk. The United States has made wonderful progress in dairy sanitation, and we probably have today the finest milk supply in the world, but there is still need for further improvement.

DISEASES AND PESTS OF ANIMALS

By John R. Mohler

Chief, Bureau of Animal Industry, Department of Agriculture

Decline In Disease.—The livestock industry has ended another satisfactory year in regard to the health of livestock. It is gratifying that no serious foreign livestock diseases gained entrance to the United States; outbreaks of animal maladies within this country also were comparatively limited in extent. Of nearly 75,000,000 food animals slaughtered in Federally inspected plants only about 1.6 per cent were affected by disease to such an extent as to cause condemnations of parts or entire carcasses. This seemingly small percentage, however, represents considerably over 1,000,000 animals, a fact which shows the importance of continuing methods of disease control and prevention.

Tuberculosis.—As in the past years the important infectious diseases affecting livestock included infectious abortion, tuberculosis, hog cholera and tick fever. In the case of tuberculosis, hog cholera, and tick fever intensive campaigns are in progress for their suppression. The effectiveness of coöperative measures conducted by Federal, state and local authorities to eradicate tuberculosis is definitely shown by a gradually declining percentage of tuberculosis in cattle and swine. The eradication campaign proceeded at the rate of about a million tests a month and extended to all States of the Union and to Alaska and Hawaii. Nov. 1, 1930, there was a total of 1,055 counties from which tuberculosis had been practically eradicated, or considerably more than one-third of the 3,073 counties in the entire United States. Similar work is being carried on in about 400 other counties, thus placing approximately half of the counties in the United States on the battleground of the war against tuberculosis.

Hog Cholera.—The number of outbreaks diagnosed by Federal and state veterinarians as hog cholera was slightly more than 4,000, which is the lowest since 1925 and much less than the average since that time. This is an indication that hog cholera is being kept under reasonably effective control. Ordinarily, outbreaks are the result of failure of swine owners to administer the preventive-serum treatment in time or to observe sanitary precautions which help to keep infection from their farms. Federal veterinarians who are trained in this work have continued to coöperate with state and local authorities, practicing veterinarians, and swine owners in the investigation of outbreaks, supervising the cleaning and disinfection of premises, and in carrying on educational work among persons interested in the control of hog cholera.

Swine Parasites.—Reports received by the Department of Agriculture indicate that the swine owners are taking an increased interest in the control of swine parasites, particularly the injurious roundworms, by practicing a system of swine sanitation which was developed by research. The system is being widely used in the important swine-growing areas and is materially reducing losses.

Cattle Tick.—The work of freeing

the South from the cattle tick which transmits splenetic or tick fever in cattle resulted in the release from Federal quarantine Dec. 1, 1930, of 15,210 square miles of additional territory in Arkansas, Florida and Texas. Earlier in the year the last 17 counties, comprising nearly 10,000 square miles in Mississippi, had been released which lifted the quarantine from the entire state. Of the original tick-infested area only 17 per cent still remains under Federal quarantine and this area is limited to only 4 of the 15 states formerly infested with cattle ticks. Systematic dipping is gradually reclaiming additional territory from this parasite. There has been a noticeable improvement in the quality of cattle in the tick-free areas, largely as a sequence to eradication work.

Infectious abortion of cattle and other livestock is one of the most serious maladies now confronting farmers and stockmen as well as research workers. Coöperative investigations. are being carried on by the Department of Agriculture and eight state experiment stations or universities in an endeavor to find improved means of suppressing infectious abortion through a comprehensive program of laboratory research and experimentation on farms.

New Cattle Maladies.—Recent observations have revealed several comparatively new maladies among which is anaplasmosis affecting principally cattle. It is caused by a protozoan parasite in the blood and results in loss of appetite, marked depression, and frequently death. The disease resembles tick fever and has been attended by as high as 39 per cent mortality of affected animals. While it is believed that the disease is spread by a parasitic insect, no definite carrier has yet been determined and coöperative experiments are being conducted at several experiment stations in mid-western and southern states.

Johne's disease, or paratuberculosis, is another disease which has been diagnosed and is believed to be rather widespread though not yet a cause of serious loss. This malady is an incurable, infectious, bacterial dysentery affecting principally cattle but may also affect horses, sheep, deer, and goats. No satisfactory treatment for it is known, but its presence or absence may be determined by the johnin test.

Poisonous Plants.—Livestock owners, especially in range areas, have experienced heavy losses from various kinds of poisonous plants. The reduction of such losses is usually best achieved by keeping livestock away from the plants, especially when the animals are very hungry. Both state and government publications are available which will aid livestock owners to familiarize themselves with the distribution and appearance of stock-poisoning plants.

Remedial Research.—Many state and other reasearch institutions are coöperating actively with the Federal Government in investigations to determine the extent and cause of losses from other animal diseases and pests and in the development of means of combating them most effectively. Research work with poultry is continually in progress and is aimed particularly at the development of improved means for combating such troubles as pullorum disease, infectious bronchitis, tuberculosis, roup, and coccidiosis of domestic fowls, and blackhead of turkeys. Various parasitic diseases of livestock, such as those resulting from infestation of stomach worms, roundworms, tapeworms, flukes, and others, cause losses that are commonly underestimated. Young animals, especially, are susceptible to serious injury. Preventive measures to be effective must destroy the parasite at some stage of its life cycle, preferably in its least resistant form. Numerous external parasites, such as mites, lice, grubs, and ticks, may also infest livestock, and their presence in a locality usually indicates lack of concentrated effort toward control.

DISEASES OF PLANTS

By Neil E. Stevens

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WEATHER RELATIONS

The drought of the summer which was especially severe in roughly the states from Missouri east to the Atlantic seaboard, materially affected the plant disease situation in two ways. The development of many diseases which are usually very important, such as potato late blight, and scab and blotch of apples was greatly retarded. On the other hand, the striking injury from drought tended to obscure the effect of such diseases as were present, not only by the actual damage it caused but in the tendency to attribute any observed decrease in yield directly to drought.

TREES

The Dutch elm disease was found this summer in America for the first time. The earliest reports were from Cleveland and Cincinnati. This disease was first observed in Holland in 1919 and has since been found in England, France, Belgium, Germany, Austria, and Norway. The fungus (*Graphium ulmi*) causing the disease develops principally in the sapwood of affected parts of the tree. Wilting and dying of the leaves of one or more branches or of the entire tree, together with dark streaks in the sapwood, are characteristic symptoms. Affected trees sometimes die quickly, but usually last for two or three years after the first wilting of the branches.

FIELD AND VEGETABLE CROPS

The downy mildew of hops was found for the first time in Oregon and Washington. This disease was first described from Japan and has been reported several times on wild hops in Wisconsin. Since its introduction into England about 1920 it has spread practically throughout the hop-growing regions of Europe and has become a serious problem. In 1928 it was reported for the first time in hop fields in British Columbia. It was found in New York also in 1928 but did not reappear there in 1929. The white rot of onions was found for the second time in Virginia and for the fourth time in the United States. The previous reports of its occurrence in this country were from La Grande, Ore., in 1928; from near Norfolk, Va., in 1923, 1924, and 1925; and from near Louisville, Ky., in 1925. The disease is important in parts of Europe.

CEREAL AND FORAGE CROPS

The results of a survey for stinking smut in spring wheat showed that on the average there was about 3 per cent smut in all spring wheat fields. Treated fields showed an average of about 2 per cent and untreated fields 4 per cent. Only two-thirds of the farmers interviewed treat their seed at all. Many of those who do treat are failing to prevent smut due to the use of improper methods and lack of attention to the details of treatment. With the situation as it is at present, it undoubedly pays to treat seed wheat every year. When flag smut of wheat was first discovered in this country, in Illinois, and later in Missouri and Kansas, there was considerable apprehension as to its possible future importance. The results of a re-survey conducted during 1930 indicate that the disease has not spread but on the contrary has become more limited in distribution. In the last few years the bacterial wilt of alfalfa has been found to be widespread and troublesome in this country. Some evidence has been reported indicating that the same disease, or a similar one, occurs in Turkestan.

FRUITS

During the spring and early summer there was a destructive outbreak of pear blight on the Pacific Coast, particularly in the Santa Clara Valley of California and other pear growing areas in the general vicinity of San Francisco Bay. The present epidemic in this region has been rivaled in severity only by that of 1904-1906 and is certainly much more severe than any outbreak of the disease on the Pacific Coast since that time. The known distribution of the phony disease of peach has been greatly increased by surveys conducted this summer. In addition to Georgia and Alabama where it had already been found, it was discovered in Louisiana, Mississippi, Arkansas, Tennessee, North Carolina, South Carolina, and Texas. Field surveys have shown that the disease of the strawberry known as dwarf is common in the States south of Virginia and Tennessee and rare in Virginia, Tennessee, Arkansas, and Maryland. It is caused by a nematode identical with, or closely related to, one long known to cause a disease of the strawberry in Europe.

FEDERAL QUARANTINES

There are now in effect five Federal quarantines restricting the interstate movement of plants to prevent the spread of plant diseases within the United States. They relate, respectively, to the black stem rust (*Puccinia graminis*), the bulb eelworm (*Tylenchus dipsaci*), the white pine blister rust (*Cronartium ribicola*), the Woodgate rust (*Peridermium* sp.), and the phony disease of peach, caused by an infectious virus. The regulations under only one of these quarantines, that relating to the white pine blister rust, have been modified since January 1, 1930. This revision, which became effective on June 5, was issued primarily for the purpose of extending the list of states and counties designated as infected with the blister rust to include the state of Montana and those parts of Oregon not previously so designated. Surveys during 1929 had shown that infection existed in northwestern Montana and southwestern Oregon and the extension, therefore, became necessary. Other changes of interest to shippers included the adoption of certain special sanitation requirements governing the transportation of five-leafed pines from the states of Oregon and Idaho, and to the removal of certain similar restrictions on the shipment of such pines between New York and the New England States. The last two changes were based on the spread of the fungas in the Pacific Northwest, and on the fact that blister rust infection in New York has now become substantially as generally distributed as it is in the New England States.

MARKETING AGRICULTURAL PRODUCTS

BY FREDERICK V. WAUGH

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PRICES

Market Factors.—The markets for agricultural products have been notably weak in 1930. Prices have been low. The cause of this condition appears to have been the depression in business which has brought with it unemployment, lower consumer purchasing power and a general reduction in effective demand. The depression is practically world-wide, and foreign demand as well as domestic demand has been reduced. The American farmer has not, then, had a good export market to bolster up the markets at home. The prices of many commodities produced in 1929 failed to make the seasonal increases which might have been expected, on the basis of past relationships between supply and prices. The weakness of the markets for cotton, meat, apples, and butter in the early months of 1930 indicates the effect of a lower level of demand.

Farm Index.—Crops marketed during the summer and fall months of 1930 met with no better reception.

The index number of farm prices which stood at 138 in 1929 dropped gradually from 134 in January to 123 in June. From June to August the index fell sharply to 108. Although the American farmer is paying slightly less for the things he buys today than he paid for them last year, the drop in the general price level is not nearly enough to make up for the decided drop in farm prices. From August, 1929, to August, 1930 the prices farmers paid for commodities they bought declined 4 per cent while the prices they received for their products declined 24 per cent.

Crops.—Prices during the late fall and early winter remained at low levels in spite of the most serious drought since 1901 which greatly reduced crop yields in some of the best agricultural regions in the country. The November 1 crop report of the U. S. Bureau of Agricultural Economics estimates that the average yield of 44 crops in the United States this year is 9 per cent under the average of the ten years, 1919 to 1928. Present supplies of agricultural products are not excessive and any improvement in the demand situation during the coming winter should result in a strengthening of the markets for farm products now in storage.

FEDERAL FARM BOARD

Activities.—Economists and marketing specialists have watched with interest during the past year the activities of the Federal Farm Board. The work of this board should be considered as still in an experimental stage, having covered only one complete crop year. It is probably too early, therefore, to make definite conclusions concerning the success of the Board's policies. Certain developments, however, may well be mentioned briefly here.

Cooperative Associations.—In line with the Federal Farm Board's announced policy of encouraging the formation of regional and national cooperative marketing associations, there has been a great deal of organization work during the past year, both in encouraging the formation of new cooperative associations where such organizations appeared desirable and in encouraging the federation of cooperatives into regional and national groups. Examples of national associations formed since the Federal Farm Board was appointed are Farmers' National Grain Corporation, National Wool Marketing Corporation, American Cotton Cooperative Association, National Livestock Marketing Association, and National Pecan Marketing Association.

Price Stabilization Loans.—Perhaps the action of the Federal Farm Board which has been most discussed during the past year has been the loan of money to the grain associations for the purpose of buying wheat to stabilize market prices and a similar loan to the cotton associations for the purpose of stabilizing cotton prices. Additional purchases of wheat were made in the late fall of 1930.

Acreage Adjustment.—The Federal Farm Board has sponsored a series of meetings during the past summer in the interest of a reduction in the acreage of wheat and cotton in the United States. The Board contends that the best method of strengthening wheat prices in this country is to reduce production to about the amount needed for domestic consumption, thus making the tariff on wheat effective and bringing about a price based on domestic conditions rather than on world markets.

FOREIGN AGRICULTURAL SERVICE

Bureau of Agricultural Economics.—Many agricultural products of the United States such as wheat, cotton, apples, and meat are sold both in domestic and foreign markets. The producers of these commodities and the cooperative associations and dealers who market these commodities are vitally interested in crop conditions and market prospects in foreign countries. The U. S. Bureau of Agricultural Economics has taken an important step toward supplying this kind of information for the benefit of American agriculture. A new division of the Bureau has been organized called the Foreign Agricultural Service Division, having offices in London, Berlin, Shanghai, Havre and

Marseilles. Offices in other foreign cities are contemplated. The duty of the new division is to assemble information on foreign agricultural production, competition and demand, and to analyze and interpret such information in order to supply the American farmer with the facts he needs as a basis for adjusting both his production and his marketing plans to world-wide conditions. The work of the new Division will add greatly to the fund of market data which is being made available by Federal and state agencies.

PERISHABLE AGRICULTURAL COMMODITIES ACT

Another development during the year which will probably have a decided influence on marketing conditions during coming years was the passage of the Perishable Agricultural Commodities Act and its approval by the President June 10. The act requires that within six months from the date of approval all fruit and vegetable handlers, including commission men, dealers, and brokers, must take out Federal licenses. The Secretary of agriculture has authority to suspend or revoke these licenses in case the dealer is found guilty of certain unfair practices, and to order reparations. The principal unfair practices listed in the act are: rejection or failure to deliver in accordance with contract; fraudulent charges for selling on commission; dumping without reasonable cause; false or misleading statements regarding conditions, quality, quantity, or disposition of fruits and vegetables or the condition of the market for these products. The strength of this act is particularly in the authority to order reparations. In the past it has often been a slow and expensive process to make an adjustment in case of a dispute between the shipper and the dealer. Such disputes may now be submitted to the Secretary of Agriculture by either party and can be settled quickly after an impartial investigation.

INTERNATIONAL CONFERENCE OF AGRICULTURAL ECONOMISTS

A conference which was unusually interesting to marketing specialists was the Second International Conference of Agricultural Economists held at Cornell University in August. Delegates from about fifteen foreign countries attended the conference. Many problems of marketing were discussed, including international developments in the reporting of market and crop news, the outlook service and the possibility of adjusting supplies of agricultural products to market requirements through such a service, the development of grades and standards, cooperative marketing and problems of agricultural surpluses.

HORTICULTURE

By William A. Taylor

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FRUIT AND THE DROUGHT

Apples.—The drought of 1930, which was so severe as to cause the inauguration of relief measures by both the Federal and certain state governments, was the outstanding feature of the year in the states affected, which included important fruit-producing areas, more especially apple districts. The most immediate effect was in the failure of the apples to attain usual size so that production was greatly reduced. In some states the yield was but 50 to 60 per cent of the 5-year average for 1924-28. However, excellent yields in other states brought the commercial crop for the country to within a half-million barrels of the average for that period.

Pears are relatively unimportant in the drought-affected states. The yield of nearly 25,000,000 bushels was well above that of 1929 and also the 5-year average for 1924-28.

Peaches.—The peach crop of something over 49,000,000 bushels was about 3,500,000 more than the light crop of 1929, but about 7,500,000 bushels below the average for the preceding 5 years. Low winter temperatures and spring frosts which practically wiped out the crop in certain states reduced the yield rather than the drought.

Other Fruits.—Grapes, oranges, lemons, grapefruit, prunes, plums, and cherries, all of which are produced commercially in restricted regions as compared with the wide distribution of apple and peach production, and in states where conditions generally were favorable, yielded in some instances from 15 to over 50 per cent more than in 1929 and in most cases appreciably above the 5-year average for 1924-28. The effect of the drought, prolonged in some regions throughout the season, on the formation of fruit buds for next year's crop and on the vitality of the trees is problematic, as the winter season approaches.

SPRAY REMOVAL

The removal of arsenical spray residues from apples and pears has received much attention during the past three years or more in the semi-arid regions of the West, and fairly satisfactory methods of accomplishing it have been worked out and generally adopted. Under normal summer rainfall in the humid fruit-producing regions east of the Rocky Mountains spray removal has not required much serious consideration. But because of the almost entire absence of rain during the growing season in some of the apple-producing sections of Maryland, Virginia, West Virginia, Illinois and some of the other middle latitude states in the Mississippi Valley, which normally washes off spray mixtures sufficiently to meet the legal tolerance, the problem of spray residue removal was very strongly brought to the attention of the growers in these sections. The installation of much washing machinery became a necessity.

LEGISLATION

In Federal legislation, the passing by Congress of an amendment to the Patent Law whereby its provisions are extended to include new varieties of certain types of plants, and which was approved by the President, May 23, 1930, is regarded by many as the inauguration of a new epoch in horticulture. Heretofore the originator or discoverer of a new horticultural variety has had no control over it except through specific contracts after it was first introduced to the trade. The idea of the plant patent is to give the plant breeder protection comparable with that secured to the inventor of a new mechanical device when the Government issues him a patent on it.

MEDITERRANEAN FRUIT FLY

In the horticultural review of 1929 reference was made to the discovery of the Mediterranean fruit fly in citrus fruit in Florida as the most striking and disturbing feature of the year. The menace was portentous in the extreme. Not less striking, and perhaps without a parallel in the annals of economic entomology as related to horticulture, is the effectiveness of the eradication and control measures that were applied in the emergency while it is too soon to say that the complete extermination of the insect in Florida has been accomplished by the one year's work, evidence available indicates that to be the case.

FRUIT AND VEGETABLE PRESERVATION

Frozen Pack.—Interest in the frozen pack of fruits and vegetables has materially increased during the past year, not only in the Northwest where perhaps the commercial developments have progressed farther than elsewhere in the country, but in other regions as well where the possibilities of preserving peaches, figs and other fruits by this means have been undertaken on a commercial scale. Many problems, however, remain to be solved before methods, limitations and fundamental factors of successful operation are as well known as they are in some of the older methods of fruit and vegetable preservation as, for instance, canning where sterilization is by high heat instead of extreme cold.

Tomato juice preserved by canning or bottling, though not a new product of the year, has undoubtedly gained considerably in popularity during that period. Served very cold in place of soup, especially in hot weather, it has found considerable favor. Besides being refreshing and palatable, its reputed vitamin content has undoubtedly afforded good advertising vantage.

FRUIT DISEASE

Pear Blight.—Two fruit disease situations have attracted considerable attention during the year. A serious outbreak of pear blight in the orchards of California; and the phoney peach disease eradication campaign that has been going forward in Georgia. The occurrence of pear blight to an unusual and alarming extent appears to have been one of those sporadic outbreaks which takes place from time to time but which can be correlated with no known cause.

Phony disease of the peach has been shown beyond a doubt to be a communicable virus disease which infects certain tissues of the roots and does not itself extend into the above-ground parts. Since a tree once attacked does not recover and not only soon becomes worthless from the standpoint of fruit production but a menace to healthy trees surrounding it, a thoroughgoing campaign of eradication of diseased trees in the sections of Georgia where the trouble had become widespread and serious was organized and has been going forward systematically during the year under Federal and state supervision. The occasional occurrence of this disease in a number of other southern states besides Georgia has been recorded recently.

INTERNATIONAL CONGRESS

An event of world-wide interest was the International Congress of Horticulture which was held August 7 to 15, 1930, in London. This brought together leading horticulturists from many different countries and resulted in the making of personal contacts and exchange of views which can hardly help but prove advantageous in many ways.

FORESTRY

By Herbert A. Smith

Assistant Forester, United States Forest Service

FOREST DEPLETION

A comprehensive survey of timber supplies and requirements, inaugurated by the United States Forest Service in 1929, was prosecuted in 1930 chiefly in the Pacific Coast Douglas fir region, with some work in the South, the Lake States, and California. To complete this survey will require years, but preliminary regional results will be announced as they are obtained. In the meantime conflicting views as to a future timber shortage are inevitable. Fundamentally the present situation is one of maladjustment of most of the industries that use the forest resource to the nature of the resource.

THE LUMBER INDUSTRY

Production.—In the absence of census statistics later than previously given (see American Year Book, 1929), estimates of the National Lumber Manufacturers' Association are shown below to bring out lumber production trends to the close of 1930:

Year	*Source of Figures*	*Board Feet*
1906	Forest Service estimate.	46,000,000,000
1916	Forest Service estimate.	40,000,000,000
1926	Census report	36,935,930,000
1927	Census report	34,532,420,000
1928	Census report	34,142,123,000
1929	National Lumber Manufacturers estimate*...	33,500,000,000
1930	National Lumber Manufacturers estimate*...	27,000,000,000

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*Published Sept. 1, 1930.

The 1930 production forecast above (virtually equal to that of 1921) may not be attained. The outstanding point, however, is not the drops in years of business depresson, but the decline when most basic industries were increasing their activity. Compared with steel or concrete, for example, lumber production has lagged strikingly. The industry is and has long been equipped for far greater production than the markets can absorb. This overdevelopment has been stimulated by pressure to liquidate stumpage values, with resulting intense competition and instability. No other manufacturing industry carries such long-time supplies of raw material. Deflation is reducing some of the far-western private stumpage from an asset into a business liability, and forcing its disposal through profitless manufacture. One consequence is waste of the resource.

Timber Conservation Board.—At the instance of the forest industries, President Hoover created, early in December, a so-called Timber Conservation Board made up of three Cabinet officers, four representatives of wood-using industries and timberland owners, three officers of conservation organizations, and three representatives of the general public. Its purpose is to obtain a thorough-going, impartial analysis of the causes of instability, overproduction, and other ills affecting the forest industries, of waste in the utilization of timber resources, of forces making for forest depletion and premature cutting of timber, and of governmental policies relating to or affecting the industries; and to devise possible measures that will be remedial for the industries, promotive of timber and forest conservation, and beneficial to the general welfare.

Exports and Imports.—In 1929 exports of lumber approximated 3,344,600,000 board feet and imports 1,573,500,000 board feet. Since 1919 lumber exports have more than doubled. Imports have shown no marked tendency either to increase or to decrease. The leading source of imports is Canada. Recently imports from northern Europe, although small, have been increasing. Last summer imports from Russia caused vigorous protests from lumber producers. Russian pulpwood shipments likewise created uneasiness. On Nov. 24 the Treasury Department issued customs regulations designed to insure compliance with Section 307 of the new Tariff Act, which prohibits the importation of goods produced wholly or partly by convict labor. The Tariff Act placed a duty of $1 per 1,000 board feet on fir, spruce, pine, hemlock, and larch lumber planed or dressed on more than one side, with an exception admitting free such lumber from either Canada or Mexico if no duty is imposed by these countries on smilar lumber from the United States. At present Canada imposes such a duty; the law therefore gives a certain measure of protection against Canadian and European imports.

PUBLIC FOREST PROTECTION AND ADMINISTRATION

Fire Protection.—Revised estimates place the area of state and privately-owned forest land needing protection from fire at 416,761,000 acres. In 1930, 38 states afforded some form of systematic protection to approximately three-fifths of this land. Federal ownership includes in the continental United States about 100,000,000 acres, and in Alaska probably at least two-thirds as much more. Federal protection is now given in greater or less degree to all national forest, national park, Indian reservation, and public domain timberlands in the continental United States. In Alaska some 5,000,000 acres of coastal timberlands are under administration as National Forests, but the vast interior public domain forests are virtually without protection. State protective systems are coöperatively financed. In the fiscal year 1930 the Federal Government contributed $1,302,694.26; private landowners, $1,197,005.09, and the states, $2,912,469.44. The total coöperative expenditures of $5,412,168.79 were 40 per cent of the amount estimated to be necessary for adequate protection of all state and private forest lands

The protection of federal forest lands likewise is insufficiently financed.

Forest fire losses for the entire country in 1930 are not yet known. In the East severe drought made protection difficult. Fires in national forests in 1930 were more numerous than in 1929 but were held to one-fifth of the 1929 area of 799,082 acres and one-eighteenth the 1929 damage of $4,338,755, with suppression costs less than two-fifths of the $3,203,191 spent in 1929. Better equipment, organization, and methods aided greatly. In 1929 fires on lands protected by the states covered approximately 4,000,000 acres and on unprotected lands, as reported by the states, more than 40,000,000 acres.

Public Forest Administration.—Most of the Federally-owned timberlands save those in the interior of Alaska are in national forests, national parks, and Indian reservations. The Bureau of Indian Affairs, through its Forest Service, applies practices of forestry on the approximately 8,000,000 acres of Indian timberlands to the extent that the general policy of the Government as trustee for its wards permits. The national parks include 4,000,000 acres of timberland. The Forest Service of the Department of Agriculture administers the national forests. Much of the land in them will not produce comercial timber but has brush, grass, and sparse tree growth valuable for watershed protection. On June 30, 1930, the national forest boundaries embraced 183,975,930 acres, with 160,090,817 acres in Federal ownership, 340,297 acres more than a year previously. The national forests are being blocked up, rounded out, and extended through land purchases and exchanges. During the year 4 new purchase areas were established in the East, each initiating land acquisition for another national forest. Of the present 149 national forests 127 are west of the one-hundredth meridian. Thirty-seven states have a total of about 7,000,000 acres of forest land thus classified, with town and county forests adding more than 700,000 acres.

FISHERIES OF THE UNITED STATES AND ALASKA

By Lewis Radcliffe

Deputy Commissioner, U. S. Bureau of Fisheries

GENERAL CONDITIONS

The commercial fisheries of the United States and Alaska are in a sound economic condition. They furnish employment to more than 128,000 commercial fishermen and 4,000 persons engaged in transportation. The annual harvest is in excess of 3,000,000,000 pounds, for which the fishermen receive $116,000,000. Edible fishery products constitute over 2,600,000,000 pounds for sale in the fresh state or for manufacture. In the fresh-fish trade of 1929, 84,397,000 pounds were prepared in packaged form valued at $14,813,000, and 121,543,000 pounds of fishery products were frozen. In the canning trade—the most important process of manufacture—the pack amounted to 689,447,000 pounds, valued at $101,065,000. The output of cured and smoked fishery products is estimated at 150,000,000 pounds valued at $12,000,000, and the output of fishery by-products was valued at $23,768,000. Imports of fishery products were valued at $66,566,000 and exports at $23,830,000.

MANUFACTURED PRODUCTS

Canned.—In 1929, 497 establishments were engaged in the canning of fishery products. The total production amounted to 689,446,781 pounds net weight, valued at $101,065,055, an increase of 5 per cent compared with 1928. Salmon canned on the Pacific coast, mainly in Alaska, accounted for 6,990,682 standard cases (335,552,736 pounds), valued at $56,085,697, 55 per cent of the total value of all products canned in 1929. Sardines with a production of 5,857,016 standard cases (234,543,345 pounds), valued at $18,894,943, accounted for 19 per cent of the total value. Tuna and tunalike fishes with a production of 1,504,306 standard cases (36,103,344 pounds), valued at $9,873,453, accounted for 10 per cent of the value.

By-Products.—In 1929 by-products of the fisheries were worth $23,767,656, the most important being 15,353,057 gallons of marine-animal oils, valued at $6,801,619; 142,681 tons of marine-animal meals and scrap valued at $6,801,362; fresh-water mussel shell products valued at $6,144,515; and 334,766 tons of oyster-shell products, valued at $2,524,499.

FOREIGN FISHERY TRADE

The value of the United States foreign trade in fishery products in 1929 was $90,395,769, of which $66,565,599 represented the value of imports for consumption and $23,830,170 the value of exports, an increase of 13 per cent in total trade.

NEW ENGLAND

Fishermen and Catch.—In 1929 the fisheries of New England employed 16,659 fishermen, or 11 per cent more than in 1924. The catch amounted to 603,598,050 pounds, valued at $25,619,904, an increase of 48 per cent in the catch and 36 per cent in value as compared with 1924.

Vessel Fisheries.—In 1929 landings of fish by American vessels at Boston and Gloucester, Mass., and Portland, Me., amounted to 327,096,327 pounds as landed, valued at $13,051,704, exceeding the amount and value of landings for any one year for which there are records.

Mackerel.—There was a sharp recovery from the decline in 1926 to 1928. The total catch amounted to over 46,000,000 pounds and was 49 per cent greater than the previous year. The gain was due to the appearance of a new year class, which furnished nearly 21,000,000 pounds of small mackerel.

Package Trade.—Packaged-fish trade in New England, centering at Boston and Gloucester, Mass., and Groton, Conn., increased production over 1928 about 50 per cent.

Sardines.—The sardine canners in Maine and Massachusetts packed 2,025,801 standard cases, valued at $6,897,946, during 1929. The production was about the same as in 1928, but the value was considerably less.

MIDDLE ATLANTIC STATES

Decline in Production.—According to the latest general canvass of the fisheries of New York, New Jersey, Pennsylvania, and Delaware made for 1926, production of many of the staple fish showed heavy declines as compared with 1921. Landings of fish at New York City and Groton, Conn., amounted to 75,325,000 pounds in 1929, more than in 1928. The production of menhaden was somewhat under that for 1928.

Shad.—On the Hudson River the shad fishery in 1929 was carried on by 241 fishermen and yielded 56,480 shad which weighed 196,745 pounds, valued at $30,683. This represents a decline of 29 per cent both in number and value as compared with the production in 1928.

CHESAPEAKE BAY

Menhaden.—The Virginia menhaden industry recovered somewhat from 1928, and produced a larger quantity of scrap and meal, but the value barely exceeded that for 1928. There was a smaller oil production selling at a lower price than in 1928, with the net result that the total value, in spite of increased production, was about the same as in 1928. This situation reveals the need for improved methods in the manufacture of menhaden meal and oil with a view to production of a higher quality product.

Oysters and Crabs.—Conditions in the oyster industry were little changed, although distribution has not yet kept pace in some parts of the country. The crab industry had one of its best years in 1929.

Shad.—In 1929 shad and alewife fisheries of the Potomac River were prosecuted by 773 fishermen, yielding 317,253 fish weighing 1,052,284 pounds and valued at $141,589, a decrease of 56 per cent in number, 49 per cent in weight, and 34 per cent in value.

SOUTH ATLANTIC STATES

In 1928 the fisheries of North Carolina, South Carolina, Georgia, and the east coast of Florida employed 11,882 fishermen, or 3 per cent more than in 1927. The catch amounted to 258,440,435 pounds, valued at $6,027,154, a decrease of 1 per cent in catch and an increase of 6 per cent in value compared with 1927.

GULF STATES

Volume and Value.—The fisheries of Alabama, Mississippi, Louisiana, Texas, and the west coast of Florida have been exceeded only in 1927, from which year they decreased 2 per cent in amount and 1 per cent in value. They employed 16,356 fishermen, or 8 per cent more than in 1927. The catch amounted to 191,007,176 pounds, valued at $9,866,263. The production of canned shrimp in 1929 was about the same as in the previous year, while the production of canned oysters was considerably in excess of the pack in 1928.

Florida Sponges.—In 1929 the quantity of sponges sold on the exchange of Tarpon Springs, Fla., amounted to 378,514 pounds, valued at $706,645, a decrease of 8 per cent in quantity and 3 per cent in value compared with the transactions in 1928.

PACIFIC COAST

Production.—In 1928 the fisheries of Washington, Oregon, and California produced 693,484,447 pounds, valued at $20,512,772. Compared with 1927 this is a gain of 6 per cent in the catch and a decrease of 8 per cent in value. 19,733 fishermen were employed, 4 per cent less than in 1927.

Salmon.—In 1929, a good year, the pack of salmon was 92 per cent greater than the previous year, the larger pack of humpback or pink salmon in Puget Sound constituting most of the increase. Compared with 1927, the previous "good" year, there was an increase of 8 per cent in pack.

Sardines and Tuna.—The pack of sardines in California was the largest on record, both in quantity and value, amounting to 3,831,215 standard cases valued at $11,996,997, an increase of 38 per cent in quantity and 24 per cent in value compared with 1928. The production of canned tuna was the largest on record and amounted to 1,504,306 standard cases valued at $9,873,453, an increase of 24 per cent in quantity and 18 per cent in value over the previous year.

Mackerel.—The mackerel canning industry in California continued to expand in 1929, production amounting to 592,451 standard cases, valued at $2,428,058, an increase of 52 per cent in quantity and 50 per cent in value, compared with 1928.

Halibut.—In 1929 the total weight of the catch of halibut as landed by United States and Canadian vessels amounted to 55,490,000 pounds, valued at $6,698,000, about the same as that in 1928, but a little more than for the years 1925 to 1927. Of the total landings 84 per cent were taken by United States craft and 16 per cent by Canadian.

GREAT LAKES

In 1928 the fisheries of Ontario, Erie, Huron, Michigan, Superior, and Namakan, Lake of the Woods, and Rainy Lake of the United States and Canada produced 92,913,909 pounds of fish, of which the United States accounted for 63,368,467 pounds, valued at $5,960,784, the smallest catch on record. The catch of ciscoes revealed the most serious decline; that in the United States in 1928 barely exceeding 600,000 pounds compared with a catch of about 35,000,000 pounds in 1918. A decrease occurred in the catch of every lake except Ontario. The Canadian catch amounted to 29,545,442 pounds, slightly less than in 1927. The declining yields in the lake fisheries should prove an incentive to promulgate wise conservation measures.

MISSISSIPPI RIVER AND TRIBUTARIES

The yield of fresh-water mussel shells in 1929, used in the manufacture of pearl buttons and novelties, amounted to 54,352,000 pounds valued at $1,324,919, a decrease of 6 per cent in quantity and an increase of 4 per cent in value compared with 1922. The pearl-button industry, centering in Iowa, manufactured pearl buttons and various novelties from fresh water mussel shells, to a value of $6,144,515 in 1929. The fisheries of Lakes Pepin and Keokuk show decreased yield in 1929 compared with 1928.

ALASKA

Output and Value.—The fisheries of Alaska during 1929 employed 29,283 persons, 10,921 fishermen, 16,646 in wholesale and manufacturing industries, and 1,716 in transporting fishery products. The catch in round weight, exclusive of whales, amounted to 642,498,047 pounds, valued at $16,582,219. The round weight of whales could not be determined, but products amounted to 8,925,189 pounds, valued at $502,081. There were 262 establishments (exclusive of duplication) engaged in the trade. Of these, 158 canned fish, 103 cured fish, 23 manufactured by-products, and 42 handled fresh and frozen fishery products. The output of these establishments amounted to 387,593,551 pounds, valued at $50,795,819. The salmon industry was the most important, producing 272,244,435 pounds of products, valued at $42,524,845. In value, the halibut industry was next, producing 37,456,998 pounds, valued at $4,422,605. The herring industry ranked third, producing 66,577,749 pounds of products, valued at $2,794,084.

Fur Sales.—The Pribilof Islands fur-seal herd now numbers about 1,045,000. There are killed annually between 40,000 and 45,000 seals. The skins are sold at public auction at St. Louis, Mo. At the sale April 7, 1930, 8,011 black dyed skins and 6,035 logwood-brown dyed skins were sold for Government account at a gross price of $319,290. At the second sale held Sept. 15, there were sold 20,081 fur-seal skins and 1 confiscated fur-seal skin, the total amount received being $357,992. There were sold also 375 blue-fox and 32 white-fox skins from the Pribilof Islands.

FISHERIES OF THE UNITED STATES AND ALASKA

Sections	Fishermen	Fishing Vessels	Fishing Boats	Persons on Transporters	Transporting Vessels	Products	
	Number	*Number*	*Number*	*Number*	*Number*	*Pounds*	*Value*
New England States, 1928	16,659	708	11,648	382	168	603,598,000	$25,620,000
Middle Atlantic States, 1926	9,971	617	4,504	89	63	168,012,000	12,456,000
Chesapeake Bay States, 1925	24,793	574	17,021	985	523	333,206,000	13,948,000
South Atlantic States, 1928	11,882	193	7,459	233	112	258,440,000	6,027,000
Gulf States, 1928	16,632	518	10,884	85	37	194,684,000	10,035,000
Pacific Coast States, 1928	19,733	810	7,817	356	126	705,111,000	20,512,000
Mississippi River States, 1922	12,310	—	15,538	30	13	105,734,000	4,504,000
Lake States, 1928	5,438	380	2,403	162	103	69,700,000	6,198,000
Alaska, 1929	10,921	734	5,420	1,716	416	651,423,000	17,084,000
Total: Various years, 1922–29	128,339	4,534	82,694	4,038	1,561	3,089,908,000	116,384,000

Note:—For the Lake States the number of transporters and persons on transporters are for 1922. Statistics of the fisheries of the Gulf States include those for Lake Okeechubee, Florida.

FISHERIES CONSERVATION AND PROPAGATION

Research Projects.—At the present time major research projects are being conducted by the Bureau of Fisheries in each of the geographical sections and coasts of the United States and the more important interior waters, covering some 28 important commercial and game fishes, as well as studies of organisms related to these species either as food or enemies.

Propagation.—The output of the fish-cultural stations of the Bureau of Fisheries totalled over 7,570,000,000 fish and eggs, an increase of 500,000,000 over the preceding year.

Hatchery Distribution.—The total distribution of the 369 state hatcheries amounted to nearly 4,584,000,000 of which 240,789,000 were trout; 9,173,000 bass; 865,000,000 classed as other game fish; and 3,468,243,000 commercial species. The number of fish-cultural employees at state hatcheries was 1,096 and expenditures for the propagation of fish totalled $3,624,000, approximately half of the revenues being from licenses.

COGNATE SOCIETIES

American Assn. for the Advancement of Science, Smithsonian Institution, Washington, D. C.

American Assn. of Nurserymen, Louisiana, Mo.

American Country Life Assn., 375 Lexington Ave., New York City.

American Farm Bureau Assn., 58 E. Washington St., Chicago, Ill.

American Fisheries Society, 2273 Woolworth Bldg., New York City.

American Forestry Assn., 1523 L Street N. W., Washington, D. C.

American Game Protective and Propagation Assn., 233 Broadway New York City.

American National Livestock Assn., Denver, Colo.

American Ornithologists' Union, U. S. National Museum, Washington, D. C.

American Poultry Assn., Fort Wayne, Ind.

American Society of Agronomy, Ames, Ia.

American Society of Animal Production, Lafayette, Ind.

American Society of Equity, 311 Daily Star Bldg., Minneapolis, Minn.

American Society for Horticultural Science, Geneva, N. Y.

American Society of Mammalogists, Johns Hopkins Medical School, Baltimore, Md.

American Veterinary Medical Assn., 716 Book Bldg., Detroit, Mich.

Assn. of Land-Grant Colleges and Universities, Newark, Del.

Farmers' National Council, Bliss Bldg., 35 B Street N. W., Washington, D. C.

Farm Women's National Congress, Clarksville, Ia.

Federated Farm Women of America, 26 Jackson Place, Washington, D. C.

Institute of American Meat Packers, 509 S. Wabash Ave., Chicago, Ill.

International Farm Congress of America, Continental Bldg., Kansas City, Mo.

Izaak Walton League of America (the), 214 W. Huron Street, Chicago, Ill.

Jewish Agricultural Society, Inc., 301 E. 14th Street, New York City.

Middle Atlantic Fisheries Assn., Bridge Arch No. 11, New York City.

National Assn. of Audubon Societies, Groton, Mass.

National Board of Farm Organizations, 1731 I Street N. W., Washington, D. C.

National Dairy Council, 307 N. Michigan Ave., Chicago, Ill.

National Educational and Cooperative Farmers' Union of America, 1731 I Street N. W., Washington, D. C.

National Fertilizer Assn., Investment Bldg., Washington, D. C.

National Grange of the Patrons of Husbandry, 630 Louisiana Ave., N. W., Washington, D. C.

National Highways Assn., 18 Old Slip, New York City.

National Livestock and Meat Board, Old Colony Bldg., Chicago, Ill.

National Poultry Council, Davisville, R. I.

Society of American Florists and

Ornamental Horticulturists, 247 Park Ave., New York City.

Society of American Foresters, 930 F Street N. W., Washington, D. C.

U. S. Livestock Sanitary Assn., Livestock Exchange Bldg., Wichita, Kan.

Vegetable Growers' Assn. of America, c/o F. L. Allen Co., Philadelphia, Pa.

Women's National Farm and Garden Assn., 26 E. 35th Street, New York City.

DIVISION XII

MINERAL INDUSTRIES

MINING AND ORE DRESSING

By Charles E. Locke

Professor, Massachusetts Institute of Technology

CONDITIONS IN MINING INDUSTRY

Depression.—The mining industry in 1930 had its share in the general depression. At the beginning of the year, although depression had already set in, hope existed that serious conditions might be averted. This hope proved futile as the year progressed and conditions became worse, resulting in the marked pessimism which always characterizes the low points of the curve of industrial activity. The best that could be said as the year drew to a close was that there were some slight signs of improvement which led the optimists to the belief that the peak of the depression was passing. One lesson which was re-learned, by the copper producers at least, was that, unless one has a monopoly, the fundamental law of supply and demand inevitably nullifies all attempts to fix or stabilize prices of product and that the proper remedy is to stabilize production by general agreement for curtailment, or proration, or some similar procedure.

Ore Shipments and Operations.—Water shipments of Lake Superior iron ores up to Nov. 1 were 44,595,294 long tons as compared to 61,658,660 tons for the same period in 1929, and the estimated total for the year was approximately 47,000,000 tons which is lower than any year since 1924 and a big drop from the record of 65,204,600 long tons in 1929. Steel plant operations were at a low level throughout the year, being down to 40 per cent of full capacity as late as November.

METAL PRICES

Individual Metals.—In general, metal prices moved downward during the year through October with a slight improvement in November. Copper was stabilized at 18 cents per pound during January, February and March but broke in April and dropped each succeeding month to a low of 9½ cents the last of October followed by a rise to around 11 cents in November. Lead declined from 6.25 cents per pound in New York for January to 5.151 cents for October and zinc in St. Louis from 5.229 cents during January to 4.059 cents during October. The range for tin was from 38.851 cents per pound in January to 26.802 cents for October. Quicksilver, which is fairly closely controlled, went from $121.192 per flask of 76 pounds in January to $110.596 in October and even aluminum which is practically a monopoly was cut from 24.3 cents per pound to 23.3 cents in June. Basic pig iron held at $18.50 per long ton all through the first six months of the year but in succeeding months participated in the general decline, reaching $17.00 in October. Silver reached its lowest point in years, holding around 35 cents per Troy ounce from June to October inclusive after a gradual decline from 45 cents in January. The price of platinum averaged $61.923 per Troy ounce in January, then declined to $46.00 and held there during May and June and finally continued its fall, reaching an average of $36.00 for October. The only person to profit from the depression was the gold miner since the price of his product expressed in terms of commodities actually rose as the cost of commodities declined.

Prices and Production.—The drop in prices was the natural result of decreased demand and consequent constantly increasing stocks of metals and mineral products. It was finally realized that the only remedy was to decrease production by curtailment, either voluntary or forced, or by proration of output in the case of petroleum, and even the entire cessation of operations by high-cost producers where to continue meant only the piling up of greater and greater deficits. Curtailment by tin mines was only fairly successful. In the case of copper, curtailment by producers in the United States and South America was of little avail as long as the mines in Canada and Africa continued to run at capacity and it was not until the latter part of the year when the Canadian and African people fell in line that the future began to look a little brighter. The sad position of silver was the direct result of demonetization of silver in India and internal troubles in China. These two countries formerly absorbed about 60 per cent of the world's output of this metal. Overproduction of coal and keen competition meant low prices and little profit for the coal miner. The stocks of petroleum, both actual and potential, the latter in the form of shut-in wells, reached the highest point in history. Development of natural gas wells and distribution lines continued, but this industry has not yet attained its full possibilities so that its condition cannot be judged in the same way as that of petroleum. Manganese mining in the United States was stimulated by the tariff on manganese ores.

PRODUCTION FACTORS

Demand and Supply.—Relatively few new metalliferous deposits are being found and this number is bound to decrease as time goes on. Notable new producers in 1930 were the Flin Flon copper-zinc-silver mine in Manitoba and the Mount Isa lead-silver mine in Australia. With the world's constantly growing demand for minerals the question naturally arises, how can this demand be met? So far this has been answered by the mining of lower grade deposits and penetrating to greater depths, but how long can this continue? Already the miners of iron ore in the Mesabi district of Minnesota are getting into leaner material which requires more and more mechanical preparation to remove the accompanying valueless sandy constituents. The world's deepest mines are now over 7,000 feet but one high authority has set a limit of 10,000 feet beyond which we cannot go on account of difficulties of high cost, high temperature and great rock pressure.

Mining Problems.—Although new mines to produce the common metals are not accountable for any great increase in mining operations, there is nevertheless another factor which does bring about such an increase. This modern mineral age is calling for more and greater variety of metals and non-metallic products. The metallurgist develops new alloys and also shows how to produce metals more cheaply Many elements which have been classed as rare or expensive become more common and cheaper. Among these are cobalt, beryllium, tantalum, barium, chromium, caesium, selenium and numerous others. Thus the miner has to enlarge continually the scope and extent of his operations to supply these new demands.

Mining technique continues to improve and in consequence efficiency is increased and costs are lowered, especially in the item of labor. The output per man today is double what it was fifteen years ago. In the case of a certain copper mine using open-pit methods 28 tons are produced per man shift with the expenditure of only one-tenth of a pound of explosive per ton. An Alaskan gold mine using underground methods produces 47 tons per man shift and uses one-quarter of a pound of explosive per ton. Machine power replaces hand power more and more. Friction losses are reduced and power saved by better bearings and better lubrication. The oxy-acetylene torch finds wide use for cheap repairing of broken parts of machines which otherwise would have to be replaced by new. Concrete and steel replace wood as being stronger and more lasting and cheaper in the end.

Hawkesworth detachable drill bits are now in use in most of the mines of the Anaconda Company at Butte, Montana, and save a considerable item of former expense for transporting the entire drill steel to the blacksmith shop for sharpening and tempering. Wire saws are employed by thirty slate quarries and saws tipped with tungsten carbide now cut the slate to dimensions in the mills. The work of the U. S. Bureau of Mines on the health and safety of miners continues to reduce mining hazards and lower the accident rate.

Mechanization in coal mines shows gains. Coal cutting is 70 per cent by machine. Haulage or tramming is nearly 90 per cent electrical. Loading is still 95 per cent by hand shoveling and here is the greatest opportunity for future gain. Many types of loading and conveying machines are on the market but practice has not become standardized and many details remain to be worked out to adapt the best type to a given set of local conditions and even to modify the mining method so that the machine can function to best advantage. Broader use of permissible explosives and rock dusting is reducing the explosion hazard in coal mining.

Oil Conservation.—Oil wells now recover 25 to 30 per cent of the oil by employing gas conservation and gas and water pressure to drive the oil toward the well. This is a marked gain over the old figure of 20 per cent but still a very poor showing for the conservation of this great natural resource. More efficient methods of production and transportation are much needed. Several wells have reached depths between 8,500 and 9,500 feet and drilling to 15,000 feet is being talked about. The deeper the well the longer is the life and the more uniform the production as a rule. Rotary and core drills with harder bits serve best for deep wells and derricks of steel instead of wood are built as high as 120 feet. Rotary drills give straighter holes than the older percussion type. New pipe lines for natural gas and also for gasoline continue to be laid. The transportation of the so-called "bottled gas" (propane and butane) increased to 10,000,000 gallons in 1929. It can be hauled in tank cars as relatively low pressures hold it in liquid form and it changes to gas only when pressure is removed after delivery.

Geophysical prospecting methods are increasing in variety and in breadth of application and every such increase means a greater boon to the miner. Salt domes as deep as 5,000 feet below the surface have been definitely located by geophysical methods.

LABOR CONDITIONS

The present depression has been particularly free from labor troubles. Wages have been cut if absolutely necessary, especially where the wage scale was based on the price of metal. Employers have endeavored to retain men at work by shortening the week to five and four days, by using the stagger system, and by doing all needed repairs and replacements, and some companies have even gone so far as to render financial aid to men laid off who had families to support. A new anthracite wage agreement was signed between operators and the miners' union without any special controversy.

ORE DRESSING

Mill Improvement.—In ore dressing there has been little incentive toward building new mills but much opportunity and incentive to modify and improve existing mills to increase efficiency and lower operating costs. The new Flin Flon and Mount Isa plants have been mentioned previously. The International Nickel Company in the Sudbury district of Ontario started their new large mill for differential flotation of copper and nickel. A number of mills on gold ores have changed from the cyanide process to flotation as being the more economical process. Washing of iron ores in Minnesota is growing with the mining of leaner ores and is marked by improved methods. Flotation continues to expand, especially on non-sulphide ores. Manganese carbonate is successfully floated at Butte, Montana, and the flotation of phosphate in Florida is now on a firm commercial basis. No radically new machines or processes have appeared. The use of the Symons cone crusher has become almost universal and flotation machines of the matless or air jet type have found new applications.

COAL PREPARATION

Coal preparation has shown further expansion as a result of growing demand for clean coal of uniform quality to give better satisfaction to the consumer and save freight on inert material. Practice has not become as well standardized as in ore dressing and various machines and methods, both wet and dry, are in keen competition. In the anthracite field one large company has adopted the policy of centralizing its cleaning in a few big breakers. Another company has adopted the Chance sand flotation process for all its cleaning. The Pittsburgh Coal Company is making an extensive study of the possibilities of applying froth flotation to its fine coal but no commercial froth flotation plants are yet in operation in this country.

COAL AND COKE

By R. Dawson Hall

Editor, *Coal Age*

MECHANIZATION

Motor Cutting and Loading Machines.—Though 1930 has been a time of difficulty for the coal industry, it has not been without technical significance. One of the most advanced mechanized plants, the Wildwood mine of the Butler Consolidated Coal Co., located a few miles above Pittsburgh, Pa., came into quantity production early in the year. This mine was laid out for working with the largest cutting, drilling and loading machines constructed. Such machines never leave the track but go from working place to working place under their own power. As these monsters, especially the cutting and loading units, are ill-fitted for turning right angles, the mine is laid throughout on 60 to 65 degree angles, making the pillars of diamond shape instead of rectangles. Two types of loaders are used, one much more flexible than the other, which these unusually high-capacity machines, are 57 feet long and weigh 30 tons. The mine layout was made to fit the needs of these large machines.

Crosscut Loading.—Another interesting layout is that of the "checkerboard system," which takes its name from the fact that the pillars left between the rooms are split by crosscuts as wide as the pillars. The fault with all forms of loading into cars at the face has been that only one car could be loaded at one time because the track had a stub end which reduced capacity. Loading from a crosscut which is as wide as the room, and delaying the making of the crosscut till the machine has gone a short distance ahead, permits the coal from the crosscut to be loaded into the cars from the side, and so a whole trip of cars can be loaded at one setting. The cars may have to be removed during loading but not shuttled. So there is no delay. Moreover, loading can progress at the face when the crosscut is being cut and *vice versa*. Unfortunately, it seems best suited to mines where only a part of the coal is removed. Outputs of 16 tons per man for every man employed have been attained, a record which even strippings rarely reach.

Semi-Loader and Pneumatic Cutters.—A new so-called "semi-loader" has been devised and put in operation at Nokomis, Ill. It gathers about 75 per cent of the loose coal at the face mechanically. The rest is hand, rather than machine loaded, on the front end of the loader and lifted by the equipment into the car, as with a pit-car loader. Pneumatic coal cutters largely passed out of the mines years ago, after preparing the way for the electric cutters. Its freedom from electric sparks gave the pneumatic equipment in some cases a preference in gassy mines, but the costs of air transmission, its wastes and its lack of flexibility prevented any wide spread of the system. However, pneumatic machines are extensively used in Europe, and lately Germany has developed little hand-pneumatic coal-cutting tools which have proved quite popular. Some mines in this country have installed a few such units. These machines, with the cutting tool, weigh 25 pounds and deliver 3,000 blows a minute.

Mechanical Loadings.—It is too early to record what percentage of bituminous coal has been loaded mechanically or with the aid of mechanical devices in 1930, but in May of this year it was reported that 75.6 per cent more coal was loaded in these ways in 1929 than 1928. As there were many machines added during 1929, and in some mines somewhat late in the year, and as others have been added this year, the tonnage in 1930 is almost sure greatly to exceed that in 1929. A grand total of 37,854,000 tons were "mechanically loaded" or about 7.4 per cent of all bituminous coal produced. It is clear that large advances have yet to be made in mechanization. The figures do not include the activities in mechanized loading in anthracite mines, which while less general than in bituminous mines, are nevertheless of growing importance. In these figures nothing is said as to coal stripping, a truly mechanical loading operation. It produced in 1929, 3.8 per cent of the entire bituminous output and 2.6 per cent of the anthracite.

Wedges.—The old-time wedge by which coal was brought down before the days of explosives is once again at work in the Victor-American Fuel Co.'s mines in Colorado. But this wedge is operated mechanically. It forces down the coal with a minimum of small sizes.

Miscellaneous.—Loading machines are now used to clean tracks mechanically. Stopping drills are being used for rock work, especially for blowing aircourses over and across other airways, which aircourses are technically known as overcasts. Other air tools are used for tamping track. Shearing machines of the turret type are being used to cut trenches in the floor for draining and for trenching where electric power lines and telephone lines are to be laid.

MINING FACILITIES AND FACTORS

Ventilation has made significant advances recently. The Consolidation Coal Co. has introduced deflector-diffuser vanes for turning the vast volume of air from the fan drift through a right angle into the shaft. The volume of air to be handled at some mines almost passes belief. At one American mine 500,000 cubic feet of air per minute, or 28,000 tons daily, is thrown into the mine aircourses. At a South African mine preparations are made for the delivery of 700,000 cubic feet per minute, or about 39,000 tons of air daily. At the mine under discussion a series of vanes is distributed along the diagonal line across the turn of the airway. The air when it reaches and impinges on the vane is turned in its proper place and proceeds in an orderly way down the shaft without loss of power, which is not the case where the fan duct is merely curved or makes a square turn. Another advance is the use of revolving doors below ground, similar to the doors used in hotels and business houses during the winter. Though this door has been made unusually tight, the air pressures to be opposed are so great that an auxiliary door has been added, the revolving door providing that under no condition will air be able to enter the return airway unobstructed even for an instant of time. By due care as much as 85 per cent of the air supplied reaches the working faces, despite the high pressure involved in distribution. In the Wildwood mine an exhaust fan has been provided to drive the dust caused by underground dumping to the surface, thus ridding the mine of the explosive dust.

Portable substations that can readily be removed on wheels from place to place as the electric load center changes have been introduced at the Wildwood mine. In these substations there is every appearance of permanence, but as soon as the need for advance arrives the new station is prepared with a drillhole with an electric cable from the surface, and the machinery being on wheels can be moved in a few hours. Because of the scarcity of water at most mines economical generating stations cannot be constructed, and at some even an uneconomical plant is hardly a possibility. At the Price Hill mine of the Price Hill Colliery Co., in West Virginia, this difficulty has been met by installing a 1,440 horsepower Diesel plant to replace purchased power.

Seam Correlation.—Homer G. Turner, Lehigh University, has advanced the theory that a seam can be correlated, that is, recognized by the order of occurrence of its highly macerated and less macerated layers. One layer will be largely of wood debris and others of leaf coating, spore, resin, twig and limb residues together with structureless degradation material. In, at least, many seams the order of these is significantly similar. Evidence is held by Reinhardt Theissen, U. S. Bureau of Mines, to show that European seams contain a material there designated "dull coal" or "durain," which is almost without counterpart in American coals. It has been shown by R. R. Sayers and associates, U. S. Buréau of Mines, that in some mines, if not all which generate acid water, the discharge of acid is checked by sealing and flooding, the water being too free of air to permit of the oxidation of the pyrite.

RESEARCH

H. J. Rose has shown that Elkhorn coal gives a stronger coke after some slight exposure to air though, in general, such weathering has a contrary effect. Dr. C. D. Litman, University of California, declares that living, brilliantly-colored bacteria have been found in the heart of a lump of coal from the Otto Colliery, a deep working near Pottsville, Pa. The work of ascertaining the presence of the bacteria was performed with every care to exclude extraneous bacterial pollution. It has been found that lignite can be dried by the aid of steam without decrepitation, as always happens when lignite is dried in the air or by ordinary heating methods. Elaborate anthracite research, especially into domestic consumption, has been initiated at Primos, near Philadelphia, Pa., at the expense of anthracite operators. A domestic furnace has been designed by one manufacturer which not only stokes the fire and discharges the ashes but removes the coal from the bin, thus further meeting the competition of oil and gas.

PETROLEUM

By Ernest R. Lilley

Professor, New York University

CONSUMPTION AND EXPORTS

Increase.—If judged solely by comparison of consumption and export statistics of 1930 with those of the previous year, the oil industry of the United States might be thought to have been only slightly affected by the world-wide depression in trade. The domestic demand for its chief product, gasoline, showed a substantial increase during the first six months of the year as compared with consumption during the same period in 1929. The ratio of increase was not maintained during the last half of the year but consumption during that period was still slightly greater than during the same period of the previous year. Despite increasing supplies of gasoline from foreign fields, especially Russia, Roumania and Venezuela, exports increased about 10 per cent. The combined total for domestic consumption and exports indicates an increase of approximately 7 per cent over the figures of 420,058,000 barrels reported by the U. S. Bureau of Mines for 1929.

Wax and Kerosene.—Sales of all other products declined. Both domestic and foreign demands for wax were substantially lower. Reports from the kerosene trade indicate a similar situation. Declines in sales of these products were not, however, materially greater than in previous years and must to a large extent be considered as due to the slow but steady decrease in the demand for these products due to their replacement by gas and electricity.

Lubricants.—Sales of lubricants for the first time in many years showed substantial declines both in export and domestic markets, the total being about 5 per cent less than the shipments of 34,469,000 barrels during 1929. The shrinkage in demand centered mainly in the industrial field, consumption of motor lubricants being well maintained.

Fuel Oil and Gas.—The full effect of the slowing down of industry was felt in the fuel oil trade, where a decline of 12 per cent in demand replaced the steady annual increase of the past decade. Despite increased competition from foreign sources exports of fuel and gas oils were slightly higher than in 1929. The whole of the shrinkage in consumption may, then, be traced to decreased sales in the United States. In part this loss was due to the substitution of natural gas, a product from which the oil industry is securing increasing revenues each year, but, in the main, the decrease can be attributed to reduced industrial activity.

DOMESTIC PRODUCTION

Factors of Decrease.—The final estimate of production in the United States during 1929 as prepared by the Bureau of Mines was 1,007,323,000 barrels. While potential production was probably greater in 1930 than at any time during 1929, the quantity of oil actually brought to the surface was about 10 per cent less, the yield being approximately 901,000,000 barrels. This figure is practically the same as the totals reported for 1927 and 1928. Proration agreements made in November of 1929 resulted in reducing daily production from an average of 2,900,000 barrels to 2,600,000 barrels within a few weeks. Except for short periods in January and February production was kept close to the latter figure throughout the first half of 1930. At that time, decreased demands from refiners together with unwillingness on the part of purchasers to add to the excessive quantity of oil already in storage led to successive downward revisions of the quotas allotted in the original agreements. Because of this, daily production steadily declined during the last six months so that at the close of the year the daily yield was approximately 350,000 barrels less than it had been at the beginning.

Restrictions.—This decline is most remarkable in that it occurred during a period in which a series of the most prolific pools discovered in the country were under development. Every major producing area was compelled to organize some system of production restriction in order to keep production from flooding the market. The demand for its high grade lubricant producing crude allowed the Pennsylvania-New York district greater freedom than was enjoyed by producers in the more prolific areas of the west, but increased recovery through water flooding made production restriction necessary even in this old section.

New Pools.—In both California and the Mid-Continent the greater part of the actual production came from the older pools and districts; such as Sante Fe Springs, Long Beach, Yates, and Seminole. However, the industry was far more concerned about and its actions more largely determined by operations in recently discovered pools whose development constituted an ever-present threat to the stability of the industry. Oklahoma City pool has been proved to be one of the largest reservoirs of high grade oil ever discovered. Its production during 1930 was only a small fraction of its estimated potential. Similarly the production of the large Van pool in eastern Texas and of a number of recently discovered salt dome pools in coastal Texas and Louisiana was held in check. The Hobbs pool in southeastern New Mexico made that state an important oil producer despite the restriction of its output to approximately one-thirtieth of its potential.

California.—The high potential yields of Ventura, Elwood, and Playa del Rey had a most depressing effect upon the industry. The most serious threat to its stability, however, came from Kettleman Hills in the San Joaquin valley, discovered in October of 1928. Its full possibilities were still unknown at the close of 1930 but it was early recognized as the greatest of the gas-gasoline crude pools discovered up to the present time. Its 7,000-foot sands are capable of producing tremendous quantities of high pressure wet gas and a crude oil of 61 degrees A. P. I. gravity (composed almost entirely of gasoline) in sufficient amounts to completely demoralize the oil industry of the Pacific Coast. Despite numerous difficulties it appears that holders of leases and royalty rights in the area have been able to agree upon a plan of orderly developmnt and exploitation that will assure them of a return commensurate with the value of the reservoir and the industry escape from the debacle that would be inevitable if its production were not restrained.

IMPORTS AND FOREIGN PRODUCTION

Net imports of crude petroleum showed a decline of approximately 15,000,000 barrels from the total of 78,933,000 barrels reported in 1929. However, imports of gasoline more than doubled and together with an increase in the importation of fuel oil served to balance approximately the decline in crude oil imports. The increase in importation of gasoline and fuel oil was due almost entirely to the expansion of refining operations in plants located in the Dutch West Indies operating on Venezuelan crude.

Because of the rapid increase in production outside of the United States and the low cost of shipping oil in bulk by water it is no longer possible to omit consideration of areas outside of the country in a review of the domestic industry. A small decline was registered in production in Mexico. Drilling activity in Venezuela was restricted to the utmost but the potential yield of wells already completed made it possible to maintain production at the high rate established in 1929 without difficulty. Development work started in Roumania in 1928 and 1929 increased production to such an extent that producers were forced to initiate a system of production control similar to those in force in the United States. Probably the greatest disturbing factor in international oil trade was a further increase in Russian production and exports resulting in part from the coming into operation of newly constructed refineries and transportation facilities and in part from the necessity of exporting increased quantities of materials with which to support Russian credit.

STOCKS AND PRICES

On Jan. 1, 1930, stocks of all oils in the United States equalled 689,166,000 barrels. This total was 68,156,000 barrels greater than the quantity in storage on Jan. 1, 1929. During 1930, in contrast, stocks declined about 10,000,000 barrels. Stocks of lubricants, wax, asphalt, and coke were higher at the close of the year than at the beginning. Stocks of fuel oil were at about the same level as at the close of 1929, but the total of 40,000,000 barrels is admitted to be excessive. Gasoline in storage averaged 6,000,000 to 8,000,000 barrels higher than in 1929 throughout the whole of the motoring season and served to depress the market very seriously. In the latter portion of the year refiners, faced with the problem of storing gasoline over the winter season and in many cases of financing their operations through bank loans, made determined efforts to restrict their operations so as to relieve themselves of this burden and assure themselves of better prices during 1931. As a result stocks at the close of year were practically the same as at the close of 1929. The results of restriction of crude production were shown in a decrease in crude oil stocks of about 20,000,000 barrels.

Prices for all of the products of the oil industry were substantially lower than in 1929. Crude oil prices were maintained fairly well through the spring and summer but steadily declining prices for all products and the financial embarrassments resulting from reduced income through adherence to drastic restrictions of production made the reduction of prices in the fall inevitable.

GENERAL CONDITIONS AND OUTLOOK

It is probable that the year of 1930 will be remembered as one of the most disastrous that the oil industry has passed through. Yet in comparison with other industries it is probable that the oil industry has been rather more fortunate than the average. A number of company statements show heavy losses but a larger percentage show substantial although smaller earnings than in the years immediately previous. It would probably be fair to characterize the year as one of unfulfilled anticipation of profits rather than one of actual loss to the industry as a whole.

While the slowing down of the rate of increase in demand for gasoline and actual decreases in consumption of other products contributed heavily to the depression in the industry, over-expansion of productive capacity during 1928 and 1929 must be held responsible to an even greater extent. At the beginning of the year every portion of the industry was organized to function at a rate far in excess of the most sanguine estimates of demand. Oil in storage and potential production from recently discovered pools were greater than ever before. A network of pipe lines made practically all of this oil immediately available. Heavy investments in modern highly efficient cracking units gave refiners the ability to produce substantially greater quantities of gasoline from the crude oil treated. Competition between marketing organizations for outlets for their products had resulted in serious duplication of marketing facilities. While the expansion of American exporting facilities was not so marked, competition from foreign supplies was everywhere in evidence. At the close of the year, the condition of the industry was still far from satisfactory, capacity still being in excess of needs in all lines; but it was generally believed that, with return to normal conditions in industry, this excess of capacity would largely disappear and fair profits be secured to the oil industry.

COPPER

By Scott Turner

Director, United States Bureau of Mines

STOCKS AND PRICES

In 1930, worldwide depression of industry as a whole was reflected in severe decline of the copper industry, with diminished consumption and mounting stocks that resulted in a collapse of price and curtailment of production. The price of copper had been pegged in April, 1929, at about 18 cents a pound (17.775 cents at refineries; 18 cents delivered Connecticut Valley; 18.3 cents, c. i. f. for export) where it was held nominally until April, 1930; but world copper stocks increased steadily from a minimum of 314,000 tons in March, 1929, when the price of the metal momentarily reached 24 cents a pound, to 466,000 tons at the end of 1929. This rapid increase of stocks continued until they amounted at the beginning of November, 1930, to 627,000 tons, an increase of 35 per cent since the beginning of the year. Refined stocks of North and South America increased during the same period from 171,000 tons to 364,000 tons, an increase of 114 per cent.

Under such circumstances, the pegged price of copper naturally could not be maintained indefinitely and before its abandonment by Copper Exporters, Inc., in April, 1930, considerable amounts of copper had been sold at material concessions below 18 cents. A drastic first reduction of price to 14 cents proved so ineffective that it was soon followed by further reduction. In May, after sales at 12½ cents, an attempt was made to hold the price at 13 cents; in July it had fallen below 11 cents; it held at about 10½ cents in August, but reached 10 cents in September and 9.275 cents in October, at which price considerable copper was sold. In the middle of November there was a rapid advance to 12 cents when selling diminished and further concessions began to be made.

Early in the year it had been widely believed that the diminished sale of copper was due to a buyer's strike induced by dissatisfaction with the pegged export price of copper as determined by American producers; it was supposed that ultimate exhaustion of consumers' stocks would compel resumption of buying. This view failed to measure correctly the true extent of worldwide industrial depression.

COPPER PRODUCTION

Curtailment.—Though production of copper declined in 1930, it was not curtailed as drastically as might have been expected in view of the low prices and excessive stocks. The average daily production in January of 5,027 tons gradually declined to 4,645 tons in July but the rate of 5,080 tons reported for September slightly exceeds that of the first month of the year.

World smelter production from January 1 to November 1 was 1,484,000 tons, indicating a probable production for the year of about 1,780,000 tons, compared with the record production of 2,136,000 tons in 1929. The decline in 1930 would thus amount to about 17 per cent.

Mine production of the United States dropped from a daily rate of 2,664 tons of copper in October, 1929, when the monthly production was 82,575 tons, to a daily rate of 1,800 tons in October, 1930, with production of 55,804 tons for the month. This reduction of United States ore production contributed throughout the year to a decline of North American blister production, but blister production from South America, though materially decreased from that of 1929, actually increased after a moderate decline in the early part of 1930, so that South American blister production of October was 16 per cent greater than that of January. The combined rate of blister production from these two continents in October was only 8 per cent below the rate in January.

Canadian Mine Production.—In the previous four years Canadian mine production of copper had increased 122 per cent. In the first half of 1930, the monthly average mine production of Canada increased to 13,128 tons and in the third quarter to 16,895 tons (Strauss, S. D.—*Metals and Minerals Market*, Nov. 13, 1930, p. 5). Canada's probable mine production of copper for 1930 is thus indicated as about 180,000 tons, a 45 per cent increase for the year. This rapid increase of Canadian production is founded upon important discoveries of copper ore in recent years. Though the production of British Columbia does not promise much further increase in the near future, other provinces have by no means reached their reasonable limits of production. In Manitoba, the Flin Flon smelter of Hudson Bay Mining and Smelting Co. is expected to provide capacity for an additional 15,000 tons of copper by the end of 1930. In Quebec, Noranda mine is the principal producer. It is constructing a second smelter-unit to increase capacity to about 35,000 tons of blister copper annually. In Ontario, however, the development of the remarkable orebody of the Frood mine of International Nickel is said to have demonstrated 125,000,000 tons of copper-nickel ore believed to contain more than 5 per cent copper. It is expected to produce 8,000 tons of ore a day. At Copper Cliff, Ont., the smelting plant is being remodelled and a new copper refinery, to have an initial capacity of 120,000 tons of electrolytic copper a year, is under construction.

African production decreased slightly in the first half of 1930, from a monthly average of 14,000 tons in 1929, to 13,333 tons. In the third quarter, however, it increased to an average of 17,200 tons. If this rate continued to the end of the year, Africa's production for 1930 would total about 183,000 tons, an increase of about 9 per cent.

COPPER SHIPMENTS AND CONSUMPTION

Foreign and Domestic Shipments.—In 1930, the ratio of American exports of refined copper to domestic shipments remained practically unchanged from that prevailing in 1929, about 35 per cent of shipments being destined for export and 65 per cent for domestic consumption. Some indication of the trend of consumption is shown by figures of the American Bureau of Metal Statistics indicating a drop in United States consumption for electrical manufactures, automobiles, buildings, and manufactures for export of about 20 per cent during the first three quarters of 1930 as compared with 1929. Individual decreases were as follows: electrical manufactures 12 per cent; automobiles 38 per cent; buildings 31 per cent; and manufactures for export, 8 per cent. These four absorbed 528,000 tons of copper in 1929, or practically one-fourth of total world production.

Reduction Agreement.—At the end of the year, negotiations looking toward reduction in the output of copper were reported to be in progress among American and African producers. A conservative journal (*Metal and Mineral Markets*, vol. 1, no. 46, Nov. 13, 1930, p. 1) reports: "On good authority it can be stated that the reduction agreed upon will approximate 23,000 tons monthly, from a monthly output of approximately 150,000 tons." It would seem that the particular amount of such curtailment would be of less importance than demonstration of a coöperative spirit directed toward maintenance of sound economic conditions throughout the industry, in order that copper may be supplied as required for the support of industrial civilization in an orderly flow at relatively stable prices, fair alike to producers and consumers.

GEOGRAPHICAL DERIVATION AND CONSUMPTION

By Continents.—In 1929, the latest year for which complete data are available, the derivation of smelter production of copper by continents was as follows:

	Per cent of world total production	
North America	59.34	78.11
South America	18.77	
Europe	9.14	21.89
Africa	7.92	
Asia	4.25	
Australia	0.58	

By Countries.—The derivation of smelter production of copper by countries was as follows:

	Per cent of world total production		
United States	52.48	75.53	91.97
Chile	15.93		
Belgian Congo	7.12		
Japan	3.92	16.44	
Canada	3.81		
Peru	2.84		
Germany	2.82		
Mexico	2.05		
Spain	1.50	4.01	
Russia	1.31		
Great Britain	1.20		
All other countries		4.02	

World Consumption.—In the same year, world consumption of copper was distributed as follows:

	Per cent
North America	54.3
Europe	40.5
Japan	3.7
Rest of the world	1.5

Copper Resources of Northern Rhodesia.—During the last two years, the development of copper ore in Northern Rhodesia has been so rapid that very large reserves have now been demonstrated. A useful table in regard to them was compiled by Parsons (Parsons, A. C.—Corporate Relations of Northern Rhodesian Mining Companies, *Eng. & Mng. Jour.* Oct. 12, 1929, p. 579), part of which is here reproduced with substitution in the first column, headed "Official estimate," of later figures reported by Bateman (Bateman, Alan—The Rhodesian Copper Deposits, *Canadian Mng. & Metall. Bull.* March, 1930). All other figures are those of Parsons; they should be understood as merely indicative of orders of magnitude deemed reasonable with respect to available data.

Chile Copper.—For purposes of comparison it may be noted that Chile Copper has ore reserves calculated at 700,000,000 tons, averaging 2.12 per cent copper. Its production capacity at present is 400,000,000 pounds of copper a year; and its prospective capacity 700,000,000 pounds of copper a year, as reported by Bellinger. (Bellinger, H. C.—*Engineering & Mining Jour.* Aug. 24, 1929, vol. 128, no. 8, p. 327.)

CONCLUSION

1930 may be characterized as a year in which a rapid increase of capacity for production of copper, coincident with a sharp decline of consumption and little less than a debacle in the attempt of producers to stabilize price, has created much apprehension as to the future of the copper industry. The record of a century and a quarter of mounting consumption should be sufficient warrant, however, for presuming the requirements for copper are so vital to the welfare of modern industrial societies that consumption of the metal will continue to expand, with slight interruptions, at about the same average rate as in the past. If that is true, it is demonstrable that the probable increase of copper production will be no more than adequate for the future needs of industry.

COPPER RESOURCES OF NORTHERN RHODESIA

	Ore Resources				Production From Initial Unit			
	Official Estimate		Conjecture Based on Semi-official Data		Ore Per Day	Copper Per Year	Cost including Taxes and Depreciation	Possible Annual Production in 1399
	Tonnage	Grade	Tonnage	Grade	Tons	Pounds	(Cents Per Pound)	(Pounds of Copper)
Bwana M'Kubwa	3,000,000	3.8	7,000,000	3.8	1,000	15,000,000	16.0–16.5	15,000,000
Roan Antelope (including Roan Antelope Extension and Muliashi)	75,000,000	3.4	250,000,000	3.4	5,000	100,000,000	9.5–10.0	250,000,000
N'Kana	60,000,000	4.3	100,000,000	4.2	5,000	125,000,000	9.0– 9.5	250,000,000
Mufulira	45,000,000	5.0	100,000,000	5.0	5,000	150,000,000	9.0– 9.5	250,000,000
N'Changa	59,000,000	3.8	75,000,000	3.5	5,000	100,000,000	11.0–11.5	150,000,000
Chambishi (and or other area in N'Kana Concession)	20,000,000	3.0	50,000,000	3.0	3,000	50,000,000	10.0–10.5	50,000,000
N'Changa West Extension (and or other area in R. C. B. Concession)	39,000,000	8.5	50,000,000	6.0	3,000	100,000,000	10.0–10.5	100,000,000
Totals	301,000,000		632,000,000					1,065,000,000

GOLD AND SILVER

BY CHARLES W. HENDERSON

U. S. BUREAU OF MINES, DEPARTMENT OF COMMERCE

GENERAL

The stock market crash of November, 1929, the unemployment situation in 1930, and the lowered index of commodity prices have served to bring forth a great many discussions in the press and journals, concerning the relation between gold and silver production and world economic conditions. Suggestions for relief include bimetallism, a loan of silver to China, and a bonus on gold. Australia appears to have granted a bonus on gold production based on the quantity produced in excess of previous production. The committee on gold of the League of Nations has studied the problem. George E. Roberts, vice-president of the National City Bank of New York, and the American member of the subcommittee on gold of the League of Nations, was reported Oct. 22, 1930 (in *Mining & Metallurgy*, Vol. II, December, 1930, p. 608) in regard to the need of increased gold production, as stating that, in "his opinion an increase is not really needed, since virtually the only use gold now has in banking is to settle international balances."

In its issue of Jan. 9, 1930, the London *Times*, after referring to the effect that the fall in the price of silver has had upon the economic conditions in China, states that "obviously, a violent fall like this is bound to have a bad effect upon international commerce, until the necessary adjustments of silver prices of goods have been made; the fall in the gold value of silver will cause a rise in the silver prices of goods. This unhappy development is an object lesson to those who would lightly uproot old-established monetary practices."

PRODUCTION

World.—U. S. Bureau of Mines Economic Paper No. 6, 1929, gives a detailed summary of data of world production from the earliest days to 1927. Economic Paper No. 8, 1930, gives a similar detailed summary of data of world production of silver. Economic Paper No. 10, 1930, is a study of the "Economic relations of silver to other metals in argentiferous ores." World production of gold from 1493 through 1927 has been 1,003,560,000 fine ounces and approximately 20,000,000 ounces each for 1928, 1929, and 1930. World production of silver from 1493 through 1927 has been 14,357,000,000 fine ounces. World production has averaged 250,000,000 ounces annually for 1928, 1929, and 1930.

United States.—Gold production in the United States from 1792 through 1930 has been about $4,550,000,000. The highest yearly production was $101,036,000 in 1915. It has remained between $52,000,000 and $44,000,000 annually during the period 1920-1930. Silver production in the United States from 1801 through 1927 has been approximately 2,996,000,000 ounces. Production annually for 1928, 1929, and 1930 has averaged 56,000,000 ounces.

GOLD AND SILVER CONSUMPTION

Manufactures and the Arts.—The Director of the United States Mint reports (annual report for the fiscal year ended June 30, 1930) that gold consumption in the industrial arts during the calendar year 1929 is estimated at $56,903,667, of which $24,873,136 was new material. Silver used in the arts is estimated at 42,359,082 fine ounces, of which 30,977,559 fine ounces was new material.

Monetary Stock.—The Director of the Mint also reports that on June 30, 1930, the estimated stock of domestic coin in the United States was $2,473,244,452, of which $1,496,305,505 was gold $539,959,520 standard silver dollars, $310,978,375 subsidiary silver coin, and $126,001,052 minor coin. The stock of gold bullion in the mints, assay offices, and Federal Reserve banks on the same date was valued at $3,038,560,201, and the stock of silver bullion was 11,129,557 fine ounces.

AVERAGE PRICES OF METALS AND CONTENT OF U. S. COINS

Gold.—A troy ounce of gold (480 grains) is fixed by law at a value of $20.671834625323. A $20 gold piece weighs 516 grains, of which 90 per cent—464.4 grains—is pure gold.

Silver.—A silver dollar contains 412.5 grains, of which 90 per cent—371.25 grains—is pure silver. In coining silver one ounce is valued at $1.292929. The average commercial ratio of silver to gold, with gold considered as of legal monetary value, was 38.54 to 1 in 1929. The New York market price of silver during the fiscal year ended June 30, 1930, averaged $0.46291; the lowest price was $0.33250, on June 21, 1930, the lowest (up to that time) ever recorded, and the highest price was $0.535, on July 19, 1929.

MINING OPERATIONS

United States, Including Philippine Islands.—Gold production in 1930 was $46,152,000; silver 48,638,000 fine ounces (from the Director of the Mint and U. S. Bureau of Mines estimate). The important gold and silver producing states were Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, South Dakota, Texas, and Utah, the total for these states being $42,695,000 in gold and 47,168,000 ounces of silver, according to the western field offices of the U. S. Bureau of Mines (U. S. Geological Survey and the Governor's report are used for Alaska).

Alaska mines yielded $8,394,000 in gold in 1930 as compared with $7,761,000 in 1929. In 1930, placer mines yielded 57 per cent and lode mines 43 per cent of the gold. The bulk of the increase in production of gold is attributable to the operations of the Fairbanks Exploration Co. in the Fairbanks district of central Alaska, where its five modern dredges were in operation continuously throughout the open season. In the Territory there were in all 26 dredges in operation in 1930. The bulk of the lode gold continued to come from the property of the Alaska Juneau Gold Mining Co. in the Juneau region of southeastern Alaska. With the close of November, this company was able to report the total liquidation of its debt, payments having amounted to $3,378,587. The operations of this property were described in U. S. Bureau of Mines Information Circular No. 6236, February, 1930.

Arizona in 1930 yielded $3,514,000 in gold, as compared with $4,182,287 in 1929. This decrease was due to the heavy curtailment in the output of copper ore, which annually yields to the bulk of the gold output. The United Verde, Copper Queen, Calumet & Arizona, Arizona Eastern, New Cornelia, Morenci property of the Phelps Dodge Corp., MacNeill, and United Verde Extension properties all yielded less gold in 1930, as compared with the 1929 output. The Tom Reed gold mine at Oatman, Mohave County, however, showed an unusually large increase in output, Other gold producers were the Magma, Old Dominion, and Shattuck Denn. The silver output was 5,300,000 ounces in 1930, compared with 7,543,283 ounces in 1929. This decrease also was caused by the decreased output of copper ores. Though the output was much less than in 1929, the United Verde mine continued to exceed all other mines in the state as a producer of silver. Other large producers of silver, in order of their output (each of which showed a decrease from 1929) were the Calumet & Arizona, Magma, United Verde Extension, Copper Queen, Shattuck Denn, Montana (Eagle-Picher Lead Co.) and New Cornelia.

California.—Placer and lode mines in 1930 yielded $9,034,000, as compared with $8,526,703 in 1929. Gold from lode mines increased, with practically all of the larger gold mines showing a gain in output. Placer mining, largely confined to dredging operations, again showed a decrease in gold output, but active mining of copper ore during the first half of the year contributed to the gold increase. In Nevada County, producing lode mines were the Empire Star, Idaho-Maryland, Murchie, North Star and Pennsylvania. In Amador County, the Kennedy mine and mill were actively operated, and the Argonaut mine developed new ore on the 5,500-foot level. The output of the Central Eureka, however, was less in 1930. Exploration work was continued in the old Bodie district, Mono County, by the Treadwell Yukon Co. In the dredging fields, the Yuba Consolidated Co. operated 4 dredges in the Hammonton field; the Capitol Dredging Co., 3 dredges in the Folsom field, the Natoma Co. 6 dredges in the Natoma field, and the Hammon Engineering Co. operated the 2 dredges of the La Grange Dredging Co. in Merced and Stanislaus Counties. The output of silver was 1,448,000 ounces, as compared with 1,176,900 ounces in 1929. Silver-lead ores from Inyo County and silver ore from Napa County were the chief sources of the increased yield, though copper ore, particularly from Plumas County, contributed to the gain. The Kelly Rand (or Uranium) and the Santa Fe silver properties in San Bernardino County were operated jointly; silver ore was both milled on the property and shipped to smelters.

Colorado in 1930 yielded $4,516,000 in gold, as compared with $4,417,358 in 1929. Cripple Creek (Teller County) in 1930 yielded $2,527,000; San Juan County, $658,000; Park County, $494,000; Summit County, $148,000; Ouray County, $148,000; Gilpin County, $127,000; Eagle, $115,000; and Clear Creek County, $106,000. Silver production was 4,291,000 ounces in 1930 as compared with 4,397,377 ounces in 1929. Eagle County in 1930 yielded 1,542,000 ounces, San Juan County, 1,086,000; Lake County, 617,000 ounces; Mineral County, 405,000 ounces, and Saguache County, 328,000 ounces. Saguache County production was from the six months' operation of the Rawley silver-copper-lead mine at Bonanza, closed and all machinery sold for salvage in June, 1930. Mineral County production was from straight silver ores from Creede, where all operations ceased in July, 1930. The silver output from Lake and San Juan Counties was chiefly from lead-silver concentrate made from zinc-lead-silver-iron sulphide milling ores, and that from Eagle County from copper-silver-iron smelting ore. Colorado since the opening of mines in 1858 has produced through 1929 $710,961,413 in gold and 653,549,067 ounces of silver.

Idaho, never a large producer of gold, increased its output of gold from $418,545 in 1929 to $436,100 in 1930. Principal producing gold mines were the Gold Hill and Iowa mine, at Quartzburg; Idawa property at Placerville; Sherman Home mine, at Burgdorf; Mackey mine, at Mackey; and the two dredges in Boise County and one in Owyhee County. Silver production in 1930 was 9,260,000 ounces, as compared with 9,414,403 ounces in 1929. The Coeur d'Alene district produced at least 8,850,000 ounces of silver, chiefly from the Sunshine, Bunker Hill and Sullivan, Hecla, and Morning Star mines. The Page, Crescent, Dayrock, Hall-Interstate, Sherman, Triumph, and Gold Hunter mines, were also large producers of silver. The Sunshine property east of Kellogg, in 1930 increased its silver output nearly 35 per cent over the record established in 1929 and became the leading silver producer of the state. The enlarged flotation plant was worked regularly and copper-lead concentrate rich in silver was shipped to the smelter at Bradley. A large increase in the output of silver was made from the Hall-Interstate property, near Cascade. The new 120-ton flotation mill at this property was operated steadily and the mine became an important producer of silver, lead, and zinc. Owing chiefly to the opening of ore of higher than the usual grade, large increases in the silver output were made at the Page and Blackhawk properties. Thus the silver output of the state was kept nearly equal to that in 1929 despite decreases in output at other mines as indicated by the decrease in lead production from 297,389,488 pounds in 1929 to 266,286,000 pounds in 1930; and a decrease in zinc production from 91,351,000 pounds in 1929 to 74,000,000 pounds in 1930.

Montana annually produces only about $1,000,000 in gold, but in 1930 the output was only $870,000. A decrease of nearly 50 per cent in the gold output of the Butte district resulted from curtailment in the production of copper ore, but this decrease was partly offset by increases from other properties, particularly from the Spring Hill mine, south of Helena. Silver production dropped from 12,717,000 ounces in 1929 to 7,760,000 ounces in 1930. Most of the silver produced in Montana is recovered from copper ore and the output varies directly with the copper output. Copper output decreased from 297,725,973 pounds in 1929 to 198,200,000 pounds in 1930. The Anaconda Copper Co., as in the past, produced most of the state's copper from its mines at Butte. The largest producers of silver in Montana in 1930, named in order of their output, were the Anaconda Copper Mining Co., followed by the Flathead, Block P., Emma, Trout, East Butte, Butte and Superior, North Butte, Poser and Granite Bimetallic properties.

Nevada mines yielded $2,729,000 in gold in 1930 as compared with $3,384,211 in 1929. The principal producing gold mines and companies were the Nevada Consolidated Copper Co., Elkoro Mines Co., Tonopah Extension, Consolidated Copper Mines Co., Seven Troughs, Goldfield tailings operation, White Caps, Tonopah Belmont, Tonopah Mining, Gold Hill Development Co., Nevada Porphyry Gold Mines Co., and Flowery Mines Co. Silver production decreased from 4,923,526 ounces in 1929 to 4,174,000 ounces in 1930. The Tonopah district produced 1,903,000 ounces, as compared with 1,965,595 ounces in 1929. The Tonopah Extension Mines (Inc.) doubled its output of 1929 and ranked first in the state in 1930. It was followed by the Treadwell Yukon (Tybo branch) in Nye County and Combined Metals in Lincoln County. Next in rank were the Bristol Silver, Tonopah Belmont, Tonopah Mining and Elkoro Mines. Other important silver mines were the Piermont Mines Co., in White Pine County; Nevada Consolidated Copper mines; lessees of the Richmond Eureka in Eureka County. Large decreases were indicated in the output of the Consolidated Cortez, which closed in January and the Betty O'Neal, also closed in January, 1930.

New Mexico in 1930 yielded $652,320 in gold as compared with $727,162 in 1929. Zinc-lead-copper-silver-gold ore of the Pecos mine in San Miguel County, and copper-silver-gold siliceous ore of the Lordsburg district, yielded the bulk of the gold in New Mexico in 1930. Silver production in 1930 was 1,091,000 ounces, as compared with 1,121,546 ounces in 1929. The lead-silver concentrates of the Pecos, Black Hawk, and Peru flotation mills, treating complex zinc-lead ores yielded the bulk of the silver.

South Dakota in 1930 yielded $8,423,776 in gold and 105,000 ounces of silver, compared with $6,549,599 in gold and 85,182 ounces of silver in 1929. Practically all of the 1930 output was from the Homestake mine, at Lead, the largest producing gold mine in the United States. South Dakota from the year of discovery—1875 to 1930 inclusive—has produced $289,203,000 in gold, and 7,770,000 ounces of silver.

Texas.—In 1930 the Presidio mine at Shafter produced 365,439 ounces of silver, before closing in June. The Hazel mine, 16 miles northwest of Van Horn, produced 23,260 ounces in copper concentrates in a short run of its new flotation mill. The total output of gold from Texas mines from the first Government records—1885 to 1929, inclusive—mostly from the Presidio mine, has been $91,425 and for silver 22,383,284 ounces.

Utah in 1930 yielded $4,121,900 in gold, compared with $4,969,915 in 1929. As in recent years, virtually all the gold was recovered from ores and concentrates smelted. The largest producers of gold were the Utah Copper, Eureka Standard, North Lily, United States Smelting, Refining & Mining Co. (including Bingham Mines Co.), Eureka Lilly, Park Utah Consolidated, Chief Consolidated, Niagara, Bluestone Lime & Quartzite, Utah-Apex and Tintic Standard. The silver yield in 1930 was 12,940,000 ounces, as compared with 17,592,396 ounces in 1929. This decrease of about 4,600,000 ounces was equally divided between the Bingham, Tintic, and Park City regions. The principal producing silver mines in 1930 were the Tintic Standard, Silver King Coalition, United States Smelting, Refining & Mining Co., Park Utah Consolidated, Utah Copper, Plutus Chief Consolidated, North Lily, Park City Consolidated, and Bingham Prospect.

IRON AND STEEL

BY EDWIN F. CONE

ASSOCIATE EDITOR, *The Iron Age*

PRODUCTION

Business Depression.—The year 1930 in the American steel industry has been one of major depression in both production and profits. The industry has experienced one of the most severe setbacks since the war. Following 1929, the most prosperous year in history, the depression has come as a distinct shock. In 1921 there occurred a depression of large intensity and in 1924 and in 1927 there were what may be termed minor depressions. A true picture of the 1930 recession is best obtained by comparisons with these three other industrial down swings.

Pig Iron.—Estimated production of pig iron for 1930 is placed at approximately 31,600,000 gross tons, based on 11 months' data. A comparison of this with other years is as follows in gross tons, according to the data of the American Iron and Steel Institute:

1930	31,500,000*
1929	42,613,983
1927	36,565,645
1924	31,405,790
1921	16,688,126
1913	30,966,152

*Estimated.

Thus the 1930 output compares quite favorably with the other years of depression, being only 14 per cent under the 1927 volume and about the same as that of 1924. A significant fact is that this year's production is nearly double that of the year of major depression, 1921. It is, however, about 26 per cent under the record year of 1929 and about 2 per cent larger than the pre-war figure.

Steel.—As to steel production, reasonable estimates place the steel ingot and castings output for 1930 at 41,200,000 gross tons. This compares with the three periods of depression and with other years as follows in gross tons:

1930	41,200,000*
1929	56,433,473
1927	44,935,185
1924	37,931,939
1921	19,783,797
1913	31,300,874

*Estimated.

A much more favorable comparison than in the case of pig iron rules in steel. The 1930 output is only about 8¼ per cent under that of 1927 as contrasted with 14 per cent for pig iron and is about 8.5 per cent in excess of the 1924 record whereas pig iron was about equal to the 1924 total. Again significant is the fact that last year's steel output is more than double that for 1921, the year of severe depression. It is, however, 27.2 per cent under the record output for 1929 and about 31.5 per cent larger than the pre-war year or 1913 total. The foregoing presentation regarding pig iron and steel output emphasizes the fact that, while the 1930 depression has been severe, it is by no means as serious as in 1921, even allowing for a naturally expanded relative output in the nine-year period.

PRICES

Composite Prices.—When it comes to prices for pig iron and steel, the situation is difficult. If a comparison is made of quotations near the close of the year with similar periods in the other three years, the following table of average composite prices of *The Iron Age* is possible:

	Pig Iron, Per Ton	Finished Steel, Per Lb.
Dec. 9, 1930	$16.02	$2.121
Dec. 13, 1927	17.54	2.307
Dec. 11, 1924	21.34	2.531
Dec. 13, 1921	19.46	2.135

Pig Iron.—Thus lower values ruled near the close of 1930 than in the other years of depression. Pig iron at $16.02 per ton is nearly 18 per cent below the 1921 value and is lower than the corresponding periods in 1924 and 1927.

Finished Steel.—At 2.121 cents per pound as the average composite price for finished steel, the level is less than in 1921 and considerably lower than in 1924 or 1927.

Profits.—No matter at what capacity output may be, unless prices are satisfactory, protfis are few and far between. It is probable that during the last quarter of the year, hardly a steel company earned its dividends.

METALLURGICAL DEVELOPMENTS

Research.—As to metallurgical developments, constant progress was made during 1930. A feature was the spread in research. Established laboratories were very active in their investigations. Several new laboratories or research departments were organized, particularly by steel and iron companies. Commercial research has become a profitable phase of metal company operations.

Rustless Steel.—Prominent among developments in 1930 was the spread in the use of rustless steel for many purposes. Most prominent and spectacular among them was the architectural use of this remarkable alloy steel. Outstanding examples are the Chrysler tower and the exterior trim of the Empire State building. Its use on automobiles was spreading rapidly, the Ford company being the first to employ it extensively.

Miscellaneous.—There is not opportunity here to enumerate the many new developments nor the expansion of comparatively recent ones. Mention should be made of the strides made in nitriding, a new carburizing method involving the use of ammonia gas and in tungsten carbide cutting tools. There was also greater use of alloy steels, with the development of new ones, and the perfection of heat-treating methods.

ZINC

BY WALTER RENTON INGALLS

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Factors in Situation.—The situation in zinc was already bad in 1927, In 1928 and 1929 it continued bad. This was owing to causes extraneous to those that were making for the general economic depression. With the advent of the full force of the latter, in 1930, conditions in the zinc industry became very bad.

Prices.—At the beginning of 1930 the prices for spelter were £19⅝, London, and 5.45 c., St. Louis. At the first of November they were £14.7 and 4c. respectively These were substantially the lowest prices for the year, during which there was practically a steady decline.

Overproduction.—The decline in zinc was initiated by new and large ore supply which began to gather momentum in 1925-26. In 1929 this appeared to have spent its force, ore supply and spelter production coming substantially into equilibrium, but then there developed the new factor of contraction in consumption, and sharp competition among smelters had the natural effect of impairing price. The situation became demoralized through the tendency of producers in Australia, Canada and Mexico to increase their output by extending their plants and even entering upon the construction of new ones. The

International Zinc Cartel was unable to preserve order and dissolved at the end of 1929.

New Cartel Planned.—In July, 1930, the producers met at Ostend and agreed to form a new cartel, to become effective toward the end of the year, but it is doubtful whether this will be consummated and in the meanwhile the low range of price had been doing its own curtailing. Indeed many mines ceased to be profitable when spelter fell below £21 and some have been kept in operation by the smelters' guaranteeing of such a price and sacrificing their own margin. The exigency of keeping a metallurgical plant in operation is severe. Even so, the smelters of Europe must have suffered terrific losses in 1930.

Smelting Controversy.—The statistics of production in 1930 may not yet be stated. Early in the year the Belgian smelters ceased to communicate their monthly figure, and the Polish immediately thereafter did likewise. This reflected the controversy that arose between European smelters and the extraneous. The increasing smelting of zinc ore outside of Europe has been strongly resented by the Europeans, who have seen themselves being deprived of their former business.

International Position.—Of course it will be understood that in the presentation hereinbefore the international position has been solely in mind. The American is isolated therefrom by virtue of the tariff on zinc, but it is not entirely independent, for the American price must follow the London to such an extent as to forbid importation of foreign spelter.

Production Problem.—In the United States we have had the same old story of over-extended capacity utilized at only a fraction of its ability. Not even has the catastrophic price of 4c. extinguished inefficient production. In some districts labor voluntarily reduced its wages and the plants were kept going. Only one small affair came to the end of its resources. On the whole there was curtailment of production, but deliveries decreased even more and there was a steady increase of stocks in the hands of smelters, which in the end reached the highest total of record. When spelter fell below 4.5c. per pound it passed below the direct cost of production of all except the relatively few mines possessing exceptionally rich ore.

Zinc Oxide.—The conditions in the production of zinc oxide, in the marketing of which competition is less fierce, were much less distressing than in respect of the metal. An increasing proportion of zinc ore is now consigned to the direct production of zinc oxide and of lithopone.

Distilling and Roasting.—Metallurgically 1930 was of great interest. The revolutionary process of continuous distilling continued in operation at Palmerton and Depue and a unit was installed at Meadowbrook. At Monaca, Pa., preparations are being made for continuous distilling with an electrically heated furnace. The old, cyclic process of distilling is improved in minor details. Autogenous roasting continues at Langeloth. Other palnts have been modernized in their roasting departments. The fuming of zinc out of low grade ores, slags and distilling residues is practised more and more extensively. More attention is directed toward recovery of cadmium as a by-product. In general, the metallurgy of zinc tends to be raised to a higher plane.

Metallurgical Production Capacity.—The metallurgical capacity for the production of zinc is superfluous. The United States suffers from the largest excess, but the position abroad tends to become worse in that way. No new construction was instituted in 1930, but new plants and extensions of old ones previously begun were brought in. These comprised Rosita (Mexico), Flin-Flon (Canada), Tadenac (Canada), Risdon (Tasmania), Eitrheim (Norway) and a new plant in Russia. The Mexican and Russian plants are distilleries; the others are electrolyzers. It has been the advent of these plants that has created a disturbing condition. Other new plants are contemplated, but probably will be deferred until the outlook for zinc becomes more favorable. The electrolytic process does not displace the distilling process but it enables ores to be beneficiated in places where they would otherwise be valueless.

LEAD

BY ALLISON BUTTS
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PRODUCTION AND PRICES

World Tonnage.—The tonnage of lead produced in the world in 1930 was not greatly below the record total of 1929, and was approximately the same as the amount turned out in 1928. The decline as compared with 1929 was about 5 per cent, the total in 1930 having been about 1,840,000 tons of 2,000 pounds against 1,935,000 tons in 1929. Prior to 1930 the production and use of lead had been increasing steadily and rapidly ever since 1921, except for some recession in 1928. The large output figures for 1930 cannot be taken as indicative of a prosperous year for the industry, for the amount of lead consumed fell behind the production, resulting in an increase in stocks and likewise a fall in price. The momentum of large output and demand in 1929 was carried over into 1930, and as usual in the metal industries, considerable time elapsed before production was curtailed to correspond with lessened demand and lowered price.

Stocks and Prices.—It is quite evident, however, that the lead industry fared considerably better last year than was the case with the other non-ferrous metals. The increase in stocks, while considerable in the aggregate, was on the whole gradual. The price fell over 1 cent per pound during the year, but held up remarkably well except during two months. There was a drop of 0.6 cent in March and about 0.4 cent in October; during the rest of the year there were but minor fluctuations. Production also was very steady. The greater part of the curtailment took place during the months of April and June. From then on to the end of the year there was very little change in rate of output.

Average Prices.—The average price of lead at New York during 1930 was 5.5 cents per pound. At the beginning of the year it was 6¼ cents and at the end it was 5 cents. The average price during 1929 was 6.8 cents and in 1928, 6.3 cents. The average price in 1930 was the lowest since 1921, but was far above the average for that year, which was only 4.5 cents. It was also well above the average during most of the years before the World War, quite a different situation from that which exists with respect to copper and zinc, and bearing out the fact that lead continues to hold a relatively strong position. The price of lead in 1930 was again higher than that of zinc.

Producing Countries.—The figures for production of lead in the individual countries, as estimated by the American Bureau of Metal Statistics from reports received by them from the principal producers throughout the world, reveal the fact that most of the year's curtailment of production was in the United States mines, output of which apparently declined about 10 per cent from 1929. Most of the foreign countries maintained their 1929 rates of output, and Germany scored an increase of about 15 per cent. On the whole, however, there was little change in the ranking of the leading countries, and the production was divided about as follows: United States, 620,000 tons; Mexico, 275,000; Australia, 180,000; Canada, 160,000; Spain, 140,000; Germany, 130,000; Burma, 90,000; all other countries, 245,000.

PROGRESS IN METALLURGY

Corrosion.—Perhaps the greatest single factor in the widespread use of lead is the resistance of the metal to corrosion. Studies of this property have been the subject of several investigations reported on during the past year. F. L. Brady (Dept. Sci. Ind. Research, Bldg. Research Tech. Papers Nos. 6 and 8) studied corrosion of lead in buildings, particularly when in contact with cement and with timber. He found severely accelerated corrosion in many such cases and ascribes it in the case of timber to attack by acids in the wood, and in the case of cement to removal by solutions of $Ca(OH)_2$ of the protective film formed on lead in air. A. A. Bado (Anales asocn. quim Argentina, 17, 5-12, 1929) likewise found severe corrosion of lead pipe in lime-sand mortar and concrete, and concluded that the pipe in such cases should be placed in clay or coated with pitch or tar.

Calcium in Cable Sheathing.—The use of calcium instead of antimony in small amounts to strengthen lead cable sheathing was reported on favorably in the results of two investigations (E. E. Schumacher and G. M. Bouton, *Metals and Alloys*, 1, 405-9, 1930, and R. S. Dean and J. E. Ryjord, *ibid.*, 1, 410-4, 1930). The former studied the age-hardening of lead-calcium alloys containing 0 to 1.1 per cent calcium. Definite age-hardening was shown with as little as 0.01 per cent calcium, due to expulsion of calcium from supersaturated solid solution on cooling. A temperature of 265° C. is required for complete solution of 0.04 per cent calcium in lead. Dean and Ryjord recommend 0.03 to 0.04 per cent calcium as the best composition for sheathing, cooled from 225-250° C., and state that this metal lasts 10 to 100 times as long as the usual lead containing 1 per cent antimony. They found the maximum tensile strength obtained by aging lead of 0.065-0.075 per cent calcium content for 4 hours at 100° C. Increase of calcium content increases tendency to flow under stress. Reclamation of lead and copper from old or defective cable sheathing by the Western Electric Co. was described in Eng. Mining J., 130, 123-5 (1930).

Recrystallization.—B. Garre and A. Müller (*Z. anorg. allgem. Chem.*, 190, 120-2, 1930) have studied the recrystallization of lead, including the effect of adding 0.5 per cent of various elements.

Bismuth-Tin-Lead Alloy.—T. Isihara (Sci. Dept., Tohoku Imp. Univ., 1st Series, 18, 715-25, 1930) found that the abrupt volume change occurring in solid alloys of bismuth-tin-lead while heating or cooling is due to the compound Bi_2SnPb, which is stable below 76° C., and decomposes into three solid solutions above that temperature.

Lead Refining.—In lead refining the use of chlorine gas for removing zinc from desilverized lead is proving very successful. The zinc is recovered as by-product zinc chloride of exceptionally good quality. Another interesting development adopted in practice at at least one plant is the use of metallic calcium to remove bismuth from refined lead.

PUBLICATIONS

Several articles were published during the year describing practice and equipment at important lead works. These included refining at the Bunker Hill smelter (A. F. Beasley, Am. Inst. Mining Met. Eng. Tech. Pub. No. 303); the Murray smelter of the American Smelting & Refining Co. (J. B. Huttl, *Eng. Mining J.*, 129, 509-12, 1930); the Broken Hill South Works, New South Wales (W. E. Wainwright, *Eng. Mining J.*, 129, 349-50, 1930); the lead industry of Idaho (S. A. Easton, *Mining Cong. J.*, 15, 842, 845; 1929); the Eagle Pitcher Lead Co. (F. W. Sansom, *ibid.*); and the new smelter of the Phelps Dodge Corp. at Douglas, Ariz. (J. O. Amber, *ibid.*).

COGNATE SOCIETIES

American Assn. of Petroleum Geologists, Box 1852, Tulsa, Okla.

American Gas Assn., 420 Lexington Ave., New York City.

American Institute of Mining & Metallurgical Engineering, 29 W. 39th Street, New York City.

American Iron and Steel Institute, 75 West Street, New York City.

American Mining Congress, 841 Munsey Bldg., Washington, D. C.

American Petroleum Institute, 250 Park Avenue, New York City.

American Zinc Institute, 27 Cedar Street, New York City.

DIVISION XIII

MANUFACTURES AND TRANSPORTATION

GENERAL CONDITIONS IN MANUFACTURING

By L. Seth Schnitman

Chief Statistician, F. W. Dodge Corporation

BUSINESS DEPRESSION OF 1930

The Economic Reckoning.—The year 1930 turned out to be the inevitable year of economic reckoning. Though such mitigants as were applied were measurably effective, subsurface eddies were too powerful to be dammed by man-made palliatives. Thus, 1930 must go down in economic annals as a period of major depression, worse in purport, duration, and depth than any experienced in a generation, if not indeed since our political independence. The phenomena characteristic of the older order reached catastrophic proportions only a few months after the year of greatest industrial output and commercial development. This has operated, perhaps for all time, to dislodge the theory that wealth can be created without labor; indeed, a sad commentary upon the new-era philosophy which had so completely gripped our economic thinking. To be sure, the forces which brought about the business cataclysm were long in development, gaining progressively much after the manner of progression in the processes of physical disease. But few students were so mindful of the symptoms as definitely to warn of the coming malady. In this respect the depression was more serious than any that preceded it, for it was thought that the lessons of 1920-21 were so firmly implanted and our machinery of intelligence so improved that they were proof against recurrence of costly periodic booms and depressions.

Development of Causes.—Many of the causes for the 1930 depression were generated without our borders. Fanned by our own speculative emotions, they culminated in the spectacular collapses on the security and commodity exchanges during the autumn of 1929 only to be anticlimaxed during 1930. The necessary readjustments which followed the drastic shakedown of security and commodity prices were temporarily arrested during the winter of 1929-30, only to be further accelerated during the remainder of 1930 after the full extent and import of the causes became clear.

Factors Retarding Revival.—The development of installment financing which embraced almost everything from jewelry to dwellings, had tapped the market that depended so largely upon stability of income, and in its processes had stocked the consumer with a wide range of comforts typifying a higher living standard than had ever been known before. Retrenchment in industry and business throughout the civilized world released millions of workers; the consequent loss of income made more difficult the inventory position of the wage-earner and the sales position of the manufacturer and merchant; and inspired fear in those whose buying habits need ordinarily not have been changed. Though perceptible increases in commodity stocks, both raw and finished, in the hands of manufacturers and merchants, were shown, the balance sheets of many well-managed corporations reflected for the most part a transition from large merchandise inventories to large accounts receivable. It was this transition, seemingly only a matter of bookkeeping, that mirrored the large inventories in consumers' hands, and provided a too forceful limiting influence upon business revival during 1930.

Collapse in Prices.—The collapse of the price structure, particularly in the basic commodities which enter the channels of world trade, was severe, many selling under production costs in the markets of the world. World products disclosing drastic declines embraced coffee, sugar, tin, silk, cotton, wheat, rubber, wool—all important in our foreign trade. At one time or another, during recent years, these commodities were produced or marketed under governmental or associational prescription. The breakdown of restrictive programs and governmental price-pegging had been complete in several basic commodities when the United States, in its well-intentioned effort to aid agriculture, was led into a further test of the basic law of supply and demand in attempting price-fixing for wheat and cotton through purchasing operations of the newly created Federal Farm Board.

THE EMPLOYMENT SITUATION IN MANUFACTURING

Effect of Mechanization.—Unemployment occasioned by the rapid increase in mechanization during the last decade became onerous and seriously aggravated conditions in 1930. The newer industries and services which grew out of our resourcefulness and large inventive abilities could not absorb released workers fast enough. It is in this connection to be seriously questioned if the restrictive immigration policy which has become increasingly more rigid during the past ten years has not had a large role in accelerating industrial mechanization to the point where the resulting technologic unemployment has become somewhat of a boomerang. Perhaps it would have been better in furthering distribution of our wares to have cultivated the market represented by the immigrant wage-earner than to have exploited that market on native soil where living standards were measurably lower than our own.

Employment Trends. — Employment in manufacturing industries during 1930 was substantially below the high level of 1929. Incidentally, from the accompanying table it will be seen that manufacturing employment was lower in 1929 than it was in 1919, though 1929 was the year of largest output and largest wage payments on record. The increase in industrial mechanization is strikingly portrayed in the series showing horsepower of prime movers, and, though figures for 1929 are unavailable on this item, the indicated gain was about 40 per cent over 1919.

Relief Measures.—Unemployment at its worst in 1930 probably exceeded 4,000,000 though many estimates were materially larger, so drastic was the industrial relapse. Palliatives included aggressive programs for public construction of all types by municipal, state, and Federal Governments. Large-scale drives for funds by municipal and relief agencies brought measurable relief even though such efforts concededly were only temporary expedients. Mitigants ranged from apple-selling to benefit football games; from Sunday movies in blue law states to a lifting of the fruit fly ban in citrus fruits.

THE DECLINE IN FOREIGN TRADE

Exports of manufactured products declined in value about 25 per cent from 1929, reflective not alone of the retrenchment in purchasing power of our foreign customers, but even of the decline in prices. Quantitatively, the decline in exports approximated about 20 per cent from the record-breaking total of 1929. Total imports, measured in values, declined about 35 per cent and, in quantities, about 15 per cent from 1929, the large difference between the value and quantitative bases reflecting the drastic declines in the prices principally of raw materials, semi-manufactures, and foodstuffs. The declines in our foreign trade accentuated the shock to domestic industry which had come to regard trade with the nations as an effective cushion for temporary declines in domestic consumption.

BUILDING CONSTRUCTION

Loss in New Contracts.—New construction undertaken throughout the country during 1930 showed a decline of about 21 per cent from 1929, according to the contract records of F. W. Dodge Corporation. It will be recalled that the year 1929 was itself lower by 13 per cent than the year 1928. It was the construction industry that gave the earliest signs of the impending depression; new contracts trended downward since the beginning of 1929.

Residential Building. — The retrenchment in residential building which for 1929 amounted to approximately $1,000,000,000 from 1928, was further extended in 1930 by about $800,000,000. It is this branch of the industry which normally is the backbone of new construction activity, and it is residential building activity which most deeply reaches into the productive processes of mine and forest, factory and store.

Non-residential building showed a sizable decline from 1929 which, practically speaking, was the year of largest activity in this field of construction. The lag between the residential and non-residential cycle, which approximates a full year, would indicate further recession in this field for the year 1931, particularly since a large over-supply of commercial and industrial space is known to exist. Civil engineering construction, on the other hand, reached a new high level in 1930 due in part to the program of governmental agencies to ameliorate distress consequent upon industrial depression.

Output of building materials quite naturally reflected the curtailed building program. Thus large declines were recorded in the production of such materials as lumber, brick, cement, sanitary ware, structural steel, while prices for materials were lower on the average than at any time since 1917.

Difficulties Confronting Building Industry.—The year, as in manufacturing and general trade, was one of many disappointments to the building industry. It opened with a general feeling of confidence that revival could not long be delayed; that the recession, particularly in the residential field had about run its course. As the year advanced, however, other weak spots were uncovered—defaulted bond issues, mortgage foreclosures, increased vacancies, and the like. Residential building advanced in the spring only to slip back again and to be followed by the retrenchment in the non-residential field which until spring had kept up well and operated somewhat to becloud the underlying situation.

Over-Extension of Building.—It has now become evident that the five-year boom period, 1925-1929, was one in which the American people attempted to increase their physical wealth in terms of real estate by over-stimulation of credit and by producing new buildings considerably in excess of normal current needs. By the end of 1929 the nation had over-anticipated its private building requirements by a full year. Thus the readjustment of 1930, upon retrospect, was not at all surprising.

MANUFACTURING OUTPUT

Retrenchment.—On the whole, the output of manufacturing industries during 1930 was 20 per cent lower than in 1929 as based upon the composite quantitative index of the Federal Reserve Board. The index was not materially unlike that for the year 1921; but during the decade our population has grown and our industrial capacity has been materially enlarged. No important industry was spared the retrenchment which unsettled world conditions dictated.

Output and Earnings Per Worker.—Increased output per worker has continued unabated. The number of factory workers in 1929 was 3 per cent smaller than in 1919. The total value of factory output, however, was 15 per cent greater than in 1919 when the general level of prices of manufactured goods was 27 per cent higher. Making allowance for the difference in price levels, quantitatively manufacturing output in 1929 was probably 50 per cent larger than in 1919. Average earnings per factory worker, which amounted to only $437 a year in 1899, and $579 as late as 1914, advanced to the highest point in history in 1929 when the mean was $1,306. During the same 30-year period the total capacity of prime movers in factories was quadrupled.

The number of manufacturing establishments showed a gain in 1929 over the preceding biennial census, yet the decline from 1899 was at least 50 per cent, indicative of large industrial integration that has taken place since the beginning of the present century. In fact, the growth of mergers, consolidations and the like during 1930 and the years immediately preceding, doubtless produced large economies in management which further aggravated the employment conditions made difficult by a too rapid technologic improvement in manufacturing processes.

SUMMARY OF MANUFACTURES: 1849 TO 1929

Year	Number of Establishments	Wage Earners (Average Number)	Horsepower	Wages	Value of Products	Value Added by Manufacture
	Expressed in Thousands			Expressed in Millions of Dollars		
1849	123	957	(1)	237	1,019	464
1859	140	1,311	(1)	379	1,886	854
1869	252	2,054	2,346	620	3,386	1,395
1879	254	2,733	3,411	948	5,370	1,973
1889	355	4,252	5,939	1,891	9,372	4,210
1899	512	5,306	10,098	2,321	13,000	5,656
1904	216	5,468	13,488	2,610	14,794	6,294
1909	268	6,615	18,675	3,427	20,672	8,529
1914	273	7,024	22,421	4,068	24,217	9,858
1919	214	8,997	29,324	10,460	62,000	24,803
1921	196	6,944	(1)	8,200	43,619	18,327
1923	196	8,777	33,092	11,008	60,530	25,846
1925	187	8,382	35,767	10,727	62,668	26,771
1927	192	8,350	38,826	10,849	62,718	27,585
1929	207	8,743	(1)	11,422	69,418	31,687

(1) Not called for on schedule.

The automobile industry, grown to adolescence, has in a single generation, become, with the only exceptions of agriculture and building, the most important single item in the balance sheet of American business. The decline from 1929 in automobile output, measured in units, approximated 38 per cent. Quite naturally a loss of more than 2,000,000 cars and trucks from the total of 5,400,000 for 1929 had a marked effect upon the many industries whose very life-blood depended upon large production schedules in the automobile factories. Thus steel, rubber, copper and the manifold items which, when fabricated, became the passenger car or truck, were quick to reflect the declines in the production schedules of factories producing those items.

Gasoline.—The only really important manufacturing industry to show any gain in productive activity over 1929 was gasoline refining; and even here the closing months of the year showed losses from the previous year, largely dictated by an overwhelming increase in refiners' stocks due to a sharp bend in the trend of consumption which, though still upward, was at a rate materially different from earlier years.

Textiles. — The textile industries, silk, rayon, wool and cotton, all showed sizable declines in 1930 from 1929 and were on a lower production level than in several years. The clothing industries, men's and boys' suits, shoes, hosiery, knit underwear, likewise showed large reductions in production schedules.

Metals.—The metallurgical industries, iron and steel, copper, zinc, lead, reflected the drastic industrial curtailment. The decline in the output of explosives added still further evidence to the sluggishness in mining operations dictated by the general industrial depression.

Railroad Equipment.—The railroad equipment manufacturers, particularly of passenger cars and locomotives, were hit again after several lean years, but freight car manufacturers enjoyed a better year than in 1929.

Newsprint Paper.—Though the domestic output of newsprint paper showed practically no change from 1929, the consumption by publishers showed a sizable reduction; while the total output of all grades of paper products was likewise lower than in 1929.

Cigarette production continued to run apace but the rate of gain was materially reduced, while the output of cigars showed a large reduction from 1929. Even the output of electric power which has increased tremendously in recent years, both because of electrification of industry and large growth in the use of domestic appliances, showed a loss from 1929.

GENERAL OBSERVATIONS

The spring of 1930 was the one great disappointment to industry. Executives responsible for production and merchandising policies had not completely envisioned the character of the depression and had geared their programs for a rapid revival which failed to materialize, and only made more difficult the road to recovery. Many basic industries were too quick to believe that the decline in industrial activity would be short lived. But once the spring was over and its many misgivings became painfully apparent, another disappointment in the autumn left executives generally with only a modest hope that, with long, trying months of depression in the background, 1931 would show some improvement toward gradual recovery. All in all, 1930 was the most disappointing year certainly since the dawn of the century, with business failures greater, both in number and defaulted liabilities, than at any other time in our history. But despite this, dividend payments to industrial stockholders were never so great; resources of life insurance companies were larger than at any previous time, while savings bank deposits were at least as large as at any other time, even though this may partly have been due to offsetting influences by a shift of commercial accounts to savings institutions on the part of corporations and individuals who could find no more profitable employment for their funds.

The industrial malnutrition which had so completely infected the nation was not entirely without some good. A keen introspection has been born of the seeds and roots of industrial and commercial excesses and executives have once again gotten down to the task of soberly appraising the wreckage. Out of this alone, abetted by our native resourcefulness and ingenuity, must come a basic soundness for the further economic development which certainly lies just ahead.

ADMINISTRATION OF THE TARIFF

By J. D. Nevius

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COLLECTION DISTRICTS

Ports of Entry.—There are forty-eight collection districts of the United States (the district of San Diego, California, was established by the executive order of May 22, 1930). This includes one district each in Alaska, Hawaii, and Porto Rico. These districts contain three hundred ports of entry, one port in each district being designated as the headquarters port, at which port the Collector of Customs, who is the principal customs officer of the district, is stationed.

Permanent Airports.—In addition

to the three hundred ports of entry, the following airports of entry have been designated under the Air Commerce Act of 1926:

Place	*Name of Field*
Ajo, Arizona	Municipal Airport
Brownsville, Texas	Municipal Airport
Key West, Florida	Meachem Field
San Juan, Porto Rico	Escambron Field
Seattle, Washington	Boeing Municipal Field
Albany, New York	Municipal Field
Miami, Florida	Pan American Field (or 36th Street)
Seattle, Washington	Lake Union
San Diego, California	Ryan Flying Field
Buffalo, New York	Municipal Airport

Temporary Airports.—The following have been designated as temporary airports of entry:

Place	*Name of Field*
Akron, Ohio	Municipal Airport
Alhambra (Los Angeles), Calif.	Western Air Express Airport
Bellingham, Washington	Graham Airport
Detroit, Michigan	Ford Airport
Detroit, Michigan	Wayne County Airport
Derby, Vermont	Canadian Gateway Airport
Douglas, Arizona	Douglas Airport
Eagle Pass, Texas	Eagle Pass Airport
El Paso, Texas	Municipal Airport
Grand Forks, North Dakota	Grand Forks Municipal Airport
Great Falls, Montana	Great Falls Municipal Airport
Glendale, California (L. A.)	**Grand Central Air Terminal**
Havre, Montana	Havre Municipal Airport
Juneau, Alaska	Juneau Airport
Ketchikan, Alaska	Ketchikan Airport
Laredo, Texas	Laredo Airdrome
Malone, New York	Malone Airport
Miami, Florida	Curtis-Wright Flying Service Base Marine Division
Miami, Florida	Dinner Key Seaplane Base
Nogales, Arizona	Municipal Airport
Palm Beach, Florida	Curtiss Flying Base
Pembina, North Dakota	Municipal Airport
Portal, North Dakota	Portal Airport
Port Angeles, Washington	Port Angeles Airport
Port Townsend, Washington	Port Townsend Airport
Plattsburgh, New York	Mobodo Airport
Scobey, Montana	Scobey Airport
San Diego, California	San Diego Municipal Airport (Lindbergh Field)
Spokane, Washington	Felts Field (Spokane Municipal Airport)
San Juan, Porto Rico	Isla Grande
Swanton, Vermont	Missisquoi Airport
Watertown, New York	Watertown Municipal Airport

CUSTOMS COLLECTIONS

Receipts.—Duties collected on passengers' baggage amount to only about three-fifths of one per cent of the total customs receipts. Customs receipts for the fiscal year 1929 were

$593,837,677.61. Of this sum, approximately $4,533,424.86 resulted from baggage examinations, and $6,245,452.94 from informal mail entries, while over half a billion dollars was collected on cargo and freight importations.

Merchandise Entries.—Merchandise may be entered for consumption; for warehouse; for transportation and exportation; or for immediate transportation without appraisement. A consumption entry is the usual form and is used where it is desired to pay the duty on the arrival of the importations at the port of entry and to sécure delivery. If immediate possession of the merchandise is not essential and the importer desires to postpone the payment of duty, a warehouse entry may be made. Under this form of entry, the merchandise is sent to a bonded warehouse and duty is not paid until withdrawal therefrom. Merchandise remaining in bonded warehouse for more than three years becomes abandoned to the Government and is sold at public auction. An entry for transportation and exportation permits merchandise to be shipped in bond through the United States to a foreign destination without the payment of duty; and the immediate transportation entry permits an importation to be shipped in bond from the port of first arrival, without appraisement or the payment of duty, to an interior port, where a consumption entry or warehouse entry may be made.

Procedure.—When the entry is presented at the customhouse, an entry clerk examines it to determine if it is complete and properly executed. He then checks up the calculations and makes an estimate of duties to be paid, which the importer deposits. The delivery permit, stamped to indicate that the duties have been paid, is then given the importer, which, on presentation on the pier, authorizes the inspector to deliver certain packages to the importer and certain other packages, indicated on the permit, to the Appraiser's Stores for examination and appraisement. An examiner at the Appraiser's Stores examines the merchandise and approves the entered values or advances them if he believes them to be too low. While the determination of the rate of duty to be paid is a function of the Collector, an advisory classification of the merchandise is made at the Appraiser's Stores. If no irregularities are discovered, the importer is notified to call for his packages. If irregularities are discovered in the examination of packages, the examiner may call on the importer for the redelivery of the balance of the importation, which have been removed from` the pier on the delivery permit, which redelivery the importer is bound to make under the terms of his redelivery bond, so-called. After the work at the Appraiser's Stores has been completed, the papers are returned to the Collector, where the dutis owing to the Government are computed. This is known as liquidation of the entry. If the liquidated duties are less than the estimated duties which have been deposited, the difference is refunded to the importer, and if the liquidated duties are higher, the importer is called on for an additional deposit.

Appraisements Appeal..—If the importer is dissatisfied with the appraisement, he may, by appeal, secure a review by the United States Customs Court (formerly Board of General Appraisers) of the Appraiser's decision. (Sec. 501, Tariff Act, 1930.) Likewise, a review by the United States Customs Court and Court of Customs and Patent Appeals of decisions of the Collector may be obtained by the filing of a timely protest. (Sec. 514, Tariff Act, 1930.)

Awards and Penalties.—The Secretary of the Treasury is authorized to pay an award to any person other than a Government officer furnishing information to a Custom's officer regarding a violation or contemplated violation of the custom's laws, which information leads to a recovery of duties, penalties or fines, the amount of such award to be 25 per cent of the net amount recovered, but not to exceed $50,000. (Sec. 619, Tariff Act, 1930.) In the fiscal year 1930, 542 awards were made to informers, amounting to $399,999.

CUSTOMS TRANSACTIONS

In the year 1914, the port of New York collected 68 per cent of the total customs receipts of the United States. This percentage in 1922 was 63 per cent; in 1923, 57 per cent; in 1924, 58 per cent; in 1925, 55 per cent; in 1926, 55 per cent; in 1927, 54 per cent in 1928, 57 per cent; in 1929, 57 per cent; and in 1930, 56 per cent. As this indicates, the greatest increases in customs collections have been at ports other than New York.

The following condensed table of customs transactions indicates the progress of the service:

Consumption Entries:	1925	1926	1927	1928	1929	1930
Free	209,319	226,382	246,157	246,577	264,194	270,038
Dutiable	428,989	459,726	486,274	495,695	501,705	484,131
Informal entries	182,505	196,036	209,002	214,777	214,503	220,589
Mail entries	742,917	768,811	786,683	825,925	838,228	848,543
Baggage declarations	340,685	383,607	392,128	400,894	397,823	437,969
Drawback entries	21,477	24,388	25,230	26,950	29,799	31,516

UNITED STATES TARIFF COMMISSION

By Thomas O. Marvin

United States Tariff Commission

THE COMMISSION AND THE TARIFF BILL

Summaries of Information.—The commission's work during the first half of the year was a continuation of the activities which began early in 1929. At the beginning of the period of tariff legislation, *Summaries of Tariff Information*, prepared by the Tariff Commission, were published by the Ways and Means Committee for each schedule of the Tariff Act, including the free list. These summaries, running to nearly 3,000 pages, were the foundation for all the subsequent work of the commission with both houses of the Congress and their tariff committees. A supplement to the summaries, of about 600 pages, was published in the summer of 1930, giving up-to-date information on all the items in the pending bill which were subject to conference between the Finance Committee of the Senate and the Committee on Ways and Means of the House. This supplement not only brought down to date the statistical information available since the publication of the original summaries, but it focused attention on special problems which had developed upon each subject during the course of the bill through both Houses of the Congress.

Services of the Staff.—Perhaps of even more importance than the formal published documents of the commission in connection with tariff legislation was what may be termed the personal service of members of the commission's staff rendered to the committees of the Congress and to individual members during the consideration of the tariff bill. The commission made a special effort to keep all members of its staff immediately available for consultation in regard to basic information when the Congressional Committees or members of Congress called for it. The whole program of work of the commission was adapted to the requirements of Congress in the consideration of the tariff bill. In some cases the personal services of the staff took the form of direct assignment to individual senators over a period of several months, the entire time of the expert being at the command of the member to whom he was assigned. In other cases the service took the form of preparing informal memoranda upon the various subjects under consideration at the request of the tariff committees or of individual members who might or might not be on the Ways and Means or Finance Committees. Another form of the personal service was rendered directly on the floor of the Senate by members of the commission's staff who kept statistical and other information immediately available for the assistance of Senators in their discussions of particular subjects.

ADMINISTRATIVE PROVISIONS

Flexible Tariff.—In the consideration of the administrative provisions which peculiarly affect the activities of the Tariff Commission, namely, the flexible tariff and other special provisions, both the Committee on Ways and Means and the Senate Finance Committee requested the Commission to submit a statement of the problems encountered and of suggested remedies. Members of the commission appeared informally at the executive sessions of both committees, outlined the difficulties encountered in the administration of the flexible provisions of the Tariff Act of 1922, and offered suggestions for revisions of the law to meet the difficulties. At the request of members of the committee some members of the commission prepared drafts of proposed flexible provisions embodying the suggestions orally presented. Many of these suggestions were embodied in the act as finally passed.

Act of 1930.—The flexible tariff provisions of the Tariff Act of 1930 (section 336) differ from the provisions in the Act of 1922 (section 315) chiefly in making the provisions in the present act more explicit than those in the previous act, and in placing more of the responsibility of the findings upon the commission. The Tariff Act of 1922, for example, stated that whenever the President finds certain cost differences, he shall change duties or classifications within certain limits. The Act of 1930 states that the commission shall investigate differences in costs of production upon request of the President, of the Congress, upon application with good and sufficient reasons, or upon its own motion. Under the Act of 1922 the President made the findings with respect to whether the duties equalized the differences in costs of production. In the Act of 1930 the commission makes such findings, and the President, by proclamation, approves or disapproves the rates of duty and changes in classification recommended by the commission. The basis for determining differences in costs of production are broadened in the Tariff Act of 1930. In lieu of the cost of production of a foreign article the commission may accept as evidence of costs, or as supplemental to it, invoice prices or values, or wholesale selling prices of the foreign article. Transportation costs are also specifically mentioned in the Tariff Act of 1930 as factors to be taken into consideration in ascertaining differences in costs of production.

Comparison of Tariff Acts.—During the course of the consideration of the tariff bill the commission prepared a number of comparisons of rates of duty in the Tariff Act of 1922 and in the pending bill at various legislative stages. This comparison showed, for example, rates of duty by items, by paragraphs, and by schedules, for the Act of 1922 as compared with the bill as passed by the House of Representatives, as reported by the Finance Committee, as amended in the Committee of the Whole, as passed by the Senate, and finally as signed by the President. Without giving the various comparisons in detail, by schedules, it may be of interest to compare the average *ad valorem* rates for the various tariff acts during the past forty years. The average *ad valorem* rate, for the dutiable articles only, of the McKinley Tariff Law of 1890, was 48.39 per cent; for the Gorman-Wilson law the average was 41.29; the Dingley law, 46.49; the Payne-Aldrich law, 40.73; the Underwood law, 26.97; the Fordney-McCumber law, 38.24, and the calculated average for the Hawley-Smoot law, based upon imports for 1928, is 41.57 per cent. Similar averages for these various bills for both the dutiable and free lists are as follows, beginning with the McKinley bill and ending with the Hawley-Smoot bill: 23 per cent, 20.87 per cent, 25.47 per cent, 19.32 per cent, 9.10 per cent, 13.83 per cent, and 16.01 per cent.

TARIFF INVESTIGATION

Valuation Study.—During the last half of 1930 the commission was occupied with a number of investigations, either called for directly in the Tariff Act of 1930 or resulting from Senate Resolutions approved immediately after the passage of the act, requesting a number of investigations under the flexible provisions. Two important investigations imposed by the act itself are the valuation study under the provisions of section 340, and the petroleum investigation under the provisions of section 332 (f). The valuation study provides that the commission shall determine, for the period July 1, 1927, to June 30, 1929, the rates of duty which, when applied to the domestic value of the articles, would yield the same amounts of duty as nearly as possible as the *ad valorem* rates in the Act of 1930 would yield when applied to the foreign value of the articles. The commission under the law shall make a report to the Congress upon these conversions of rates not later than July 1, 1932.

Ad Valorem Rate.—The work of the commission upon this conversion problem indicates that the study will be long and difficult. Although the number of *ad valorem* rates in the Tariff Act can be counted in terms of hundreds, the number of commodities which must be studied in making conversions will run into many thousands. One reason for having an *ad valorem* rate in a given paragraph is to cover a multitude of items whose unit values vary widely. Articles manufactured of metal, for example, dutiable at one *ad valorem* rate, may be valued anywhere from one cent to $1,000 each. Therefore a specific rate of duty cannot equitably be applied. If the commission is to make an adequate study for conversion purposes, each of the important items under each *ad valorem* rate must be examined individually with respect to both the domestic value of the article, namely, the value at which the imported article is sold in wholesale quantities in the United States, duties and other charges paid, and the foreign value of "such or similar" articles. After having found the proper conversion rate for each of the many important products which may be imported under a particular *ad valorem* rate of duty, the question then arises as to what single conversion rate shall be used for the paragraph or *ad valorem* bracket. For example, articles *a* to *z*, inclusive, may be imported under a given paragraph at 40 per cent *ad valorem*, but because of differences in marketing and other charges, each item of the list may show a different ratio between the foreign and domestic values. If item *a* has a foreign value of $1.00, and a domestic value of $2.00, obviously 20 per cent duty upon the domestic value is equivalent to the 40 per cent duty upon the foreign value. On the other hand, if item *b* has a foreign value of 50 cents and a domestic value of 75 cents, then the duty upon the domestic value must be 26⅔ per cent to yield the equivalent of the 40 per cent duty upon the foreign value, namely, 20 cents. If each important item requires a different conversion rate from the point of view of exact equivalents, and yet only one conversion can be made for each *ad valorem* rate of duty, the commission is faced with the serious problem of determining the proper average conversion factor for each *ad valorem* rate.

Petroleum.—The other investigation referred to which is imposed by the Tariff Act itself, namely, that of petroleum, must be practically completed during the year 1930, because the law specifies that within eight months from the passage of the act the commission shall furnish the approximate average cost per barrel of crude petroleum to Atlantic coast refineries from the fields in the United

States during the three years preceding 1930, and the present costs of the crude oil from Lake Maracaibo, Venezuela, deilvered to Atlantic coast points. The expression "average cost per barrel to the oil refineries" raises the question of whether the price paid to the crude oil producers can be used as a basis of cost to the refineries, or whether the cost of producing crude must be examined. Some of the oil is bought from independent producers of the crude, and some is bought from subsidiaries of refineries. In most cases, however, the operating companies are sufficiently distinct from the refineries to necessitate the transfer of the crude oil at the regular "posted" market prices in the crude fields.

Even though the producing companies are sufficiently independent of the refineries to render price quotations significant, there is the further question of the comparability of Venezuelan and domestic oils from the point of view of grades. Most domestic oils, especially in the mid-continent fields, are high gravity oils yielding much gasoline, whereas Venezuelan oils are low-gravity, and are used principally for the production of fuel oil. Where the grades of imported and domestic oils are found to be approximately comparable, the comparable prices for tariff purposes may not be especially significant because, grade for grade. they may be selling for about the same amount per barrel on the Atlantic seaboard. On the other hand, if costs of production must be obtained, there are many difficult questions to be solved with respect to the depletion of oil reserves, development expenses, and the various items of costs which are, from the nature of the industry, hazardous and speculative. During the last half of 1930 the commission assembled information upon all of these subjects with a view to a report to the Congress early in 1931, within the time limit set by the law.

Furniture.—The first question in connection with the furniture investigation is to determine what kind of furniture is imported or might reasonably be expected to be imported. General classes of furniture are, ordinary wood household furniture; furniture in chief value of textiles, such as upholstered suites; bentwood, wicker and reed furniture; and metal furniture. Each of these classes of furniture has its own special problems. In the case of metal furniture, for example, it appears from the information now available that the American producers supply almost the entire domestic demand, and there is very little reason to expect imports of this product. On the other hand, in the case of bentwood furniture, imports supply a large percentage of domestic consumption, coming principally from Poland and Czechoslovakia. Wood furniture, however, must be subdivided for tariff purposes. It now appears that there is very little of the ordinary household furniture imported such as is made under conditions of mass production in American factories. The imports appear to be principally of expensive specialty products, many of which are reproductions of antiques.

Lace.—The lace investigation is particularly difficult from the point of view of comparable, and at the same time representative, samples. Each producer, whether foreign or domestic, seeks individuality in his product, and the less it is similar to other products, within reasonable limits, the better the chances for ready sale. Cost comparisons, however, must be based upon like or similar foreign and domestic products. It is relatively simple to find imported and domestic samples of lace which are in some respects technically comparable; that is to say, so many threads per inch in an approximately similar design, and made on the same type of lace machine. The other half of the comparability problem is more difficult, however, namely, the extent to which particular lists of samples are truly representative of the domestic industry on the one hand, and of imports on the other. Because of the nature of the trade it is difficult to find samples that are at any one time both imported in large quantities and produced in the United States in important quantities. If either the production or imports of a given sample are negligible the comparison may not be economically sound, no matter how nearly identical the two laces may be from the technical point of view.

Window Glass.—In the window glass investigation the comparability of the foreign and domestic product is relatively simple. For a given thickness window glass is window glass wherever produced. It might also be supposed that because the commission recently completed a window glass investigation that a new investigation could be easily disposed of. Unfortunately, however, from the point of view of an immediate report the window glass industry has greatly changed since the cost of production data were obtained by the commission for the domestic and the Belgian industry. New processes have made great headway in the last two or three years. In 1926, for example, about 10 per cent of the window glass in the United States was made by the Fourcault process. In 1929, over 41 per cent was made by this process. On the other hand, in 1926 nearly 60 per cent of the domestic glass was made by the machine-cylinder process, whereas in 1929 about 21 per cent was so made. The Fourcault and the Libbey-Owens processes account for about 86 per cent of the Belgian production in 1929 as compared with about 48 per cent in 1928. Apparently costs of production problems are never simple.

REORGANIZATION OF THE COMMISSION

New Members.—In accordance with Section 330 of the Tariff Act of 1930, which required the appointment of six tariff commissioners within 90 days after the effective date of the Tariff Act, the President appointed Henry P. Fletcher, Chairman; Thomas Walker Page, Vice Chairman; John Lee Coulter, Edgar B. Brossard, Alfred P. Dennis, and Lincoln Dixon.

Rules of Practice and Procedure.—On Sept. 29, 1930, the commission issued its rules of practice and procedure with respect to Section 336 of the Tariff Act of 1930. These rules provide that applications for investigations shall be made public when received and that the applicant should file with his application all information available to him which he believes to be pertinent, especially with respect to the comparability of the domestic and foreign article; the tendencies of production, imports, and prices, whether upward or downward, for the article under consideration; available evidence of the difference between the foreign and domestic cost of production: the areas of greatest competition between the imported and domestic product; and transportation costs and other charges incident to the delivery of the article to the principal market or markets of the United States. The rules also provide that at the public hearing, special attention is to be concentrated upon the pertinent facts in the case, such as differences in costs of production, the principal competing country, the principal markets, the reliability of invoice prices as evidence of foreign costs of production, and other significant advantages or disadvantages in competition.

In the conduct of the public hearing, a notable divergence in the practice of the commission as compared with hearings under Section 315 of the Tariff Act of 1922 is the absence of preliminary statements of information in which the tentative costs and other data obtained by the commission were submitted for the discussion and criticism of interested parties. At the hearings during October and November, brief statements of the problems involved, such as the comparability of the foreign and domestic product, the principal competing country, and methods of obtaining domestic and foreign costs were submitted for discussion and criticism but no substantive information which would indicate tentative findings of the commission were presented.

THE EXPORT AND IMPORT BALANCE

By Ralph A. Young

U. S. Bureau of Foreign and Domestic Commerce

FOREIGN TRADE EQUILIBRIUM

Exposition.—Most nations have either a steady excess of exports or a steady excess of imports for relatively long periods at a time. The explanation of the persistence of an export or import trade balance has furnished one of the problems dealt with by economic students for many years, because of the bearing such an excess may have upon international financial equilibria between nations as well as upon the financial stability of individual nations. In a world still suffering from the forced readjustment of trade flows, capital movements and international debt brought on by war, they have more than an ordinary significance today.

Depression Balances.—No period provokes greater speculation on the export or import balance than a period of world-wide industrial depression. The last slump of international scope, occurring in 1920 and 1921, was accompanied by a sharp drop in our export balance, and successive declines marked the years immediately following. In the severe depression preceding that, 1908, our export balance was greater during the year of the sharp decline in business than in the year preceding, and then fell off considerably in the ensuing years of recovery. Conditions were so different in those two earlier periods of depression, however, that comparisons cannot be pressed too closely.

HISTORICAL REVIEW

From the earliest records of the foreign trade of this country until 1873, the American balance of trade was typically on the import side. Since 1873, the balance has been characteristically on the side of exports. Various explanations have been advanced for the persistence of an import balance during the first three-quarters of the nineteenth century, but they converge, for the most part, upon the theme that, as a new and growing country, not only were we borrowing continuously abroad, but immigrants were bringing quantities of capital with them; and that the merchandise import balance roughly measured the net balance of capital imports. The appearance of an export balance about 1873 was held to reflect the arrival of the United States at a stage of industrial development where annual interest payments and principal repayments exceeded new capital borrowing from abroad; although the depression of 1873 clearly hastened the transition. After 1896, large net expenditures of American tourists abroad, the growing volume of immigrant remittances, and the appearance of American investments in foreign areas, offered additional explanations of the export balance. During the period of the World War, our immense international capital lending became the bulwark of the export balance; and, in the post-war period, additional lending in international capital markets on a gigantic scale, plus the steadily mounting wave of tourist travel (giving us a service import balance) have received the greatest emphasis as explanations of the export balance.

EXCESS OF EXPORTS: 1930

World-wide recession in production and trade, coupled with a drastic decline in commodity prices, has been reflected in a sharp contraction both of exports and imports of the United States. Exports declined by as much as $885,000,000, or 33 per cent, during the first nine months of 1930, and imports by as much as $959,000,000, or 29 per cent. No such severe declines in either our export or import trade have occurred since 1921, when exports declined roughly at 45 per cent from the $8,228,000,000 total in 1920 and imports fell about 55 per cent from $5,579,000,000. In view of the contraction in 1930 of both exports and imports, it is not strange that the net export balance for the first nine months was only $73,000,000 more than for the corresponding period in 1929, and only $70,000,000 more than for that in 1928. If the trade balance for the rest of the year follows the seasonal trend established in recent years, it will rise somewhat during the last three months of the year.

MOVEMENTS IN TRADE BALANCES

Merchandise.—The adjustment of favorable balances of trade under the complex conditions of modern international trade can never be traced completely, since merchandise transactions today represent no more than 50 per cent of the nation's total international money transactions. It is possible, however, to classify the remaining 50 per cent under service, capital, capital income and cash transactions; and by a complicated process of estimating to gain an approximate idea of the method of adjustment. Of course, no one today refers to these latter types of transactions as either the ultimate causes or results of the merchandise balance of trade. Even though all items are closely related, each possesses a certain degree of independence from the rest, and the chance interplay of separate movements always goes a long way in their equating.

The Service Balance.—Although figures indicating the probable balance of service trade for 1930 are not yet available, it is not likely that any marked net change will appear. This balance, which has been regularly on the import side, has been remarkably stable for the last eight years; and unless American tourist travel abroad—by far the most important service item—has diminished as a result of the business depression considerably more than reports would indicate, this service balance will probably remain at about last year's level. Slight shifts may occur in the total for shipping service, interest payments, immigrant remittances, and so on, as a consequence of the depression, but the net results of these transactions probably will not vary substantially.

The Capital Balance.—The capital balance, with a record for extreme instability over the past eight years, is less easily disposed of than the service balance, although it has clearly continued to be an offset to the export trade surplus. The following rough computing is tentatively offered in the absence of final figures. Publicly offered foreign securities for the first nine months of 1930 amounted to $735,000,000 minus refunding ($660,000,000 of which were floated during the first six months), as compared with $538,000,000 in the same period in 1929 and $885,000,000 in 1928. In addition, there have been reports of a number of direct American investments in foreign properties, although not on the scale prevailing in 1928 and 1929. Capital exports on account of open-market security dealings, which have unquestionably contracted sharply as a result of stock-market conditions, may have added something to the capital export balance; although it is possible that imports of foreign capital may have practically equalled exports. Capital repayment during the period was in our favor, of course, as a result of our strong international creditor position.

On the side of short-term capital, it is known that a number of short-term credits have been advanced by American bankers to foreigners. Again, acceptance credits to foreigners have exhibited a steadily expanding tendency, with the largest volume outstanding at the end of September of any similar month in the history of the American acceptance market, but the rate of growth was so much smaller in 1930 than in 1929 that a reduced capital export of about $280,000,000 occurred in this channel. Withdrawals of foreign short-term capital from the United States (as a result of the sharp decline in interest rates) may have occurred, but they were probably offset in part by flights of capital to America from countries experiencing political difficulties. Foreign deposits in this country, taken as a whole, have established a reputation for immobility; they represent not only the operating dollar-exchange assets of commercial banks of many countries, but also to a large extent the foreign-exchange reserves of foreign central banks operating under the gold-exchange standard.

The Capital Income Balance.—The first three quarters of 1930 have doubtless witnessed the smallest growth in both the gross and net long-term creditor position of the United States of any similar period since 1923. The interest and dividend balance, therefore, which amounted in the first nine months of 1929 to about $560,000,000 (including war debt income), will possibly reveal little change, any decline in that portion of it deriving from short-term capital movements and hence affected by lower interest rates, being cancelled by a slightly larger amount due on long-term capital invested abroad.

The Gold Balance.—When gold standard conditions prevail widely, as at present, gold is the balancing or cash factor of international trade; and, for the most part, it moves only when recourse to all other measures for adjusting international balances have been exhausted. During the early quarters of 1930, two important countries, Brazil and Japan, found it necessary to export large sums of gold ($67,000,000 and $126,000,000 respectively) in the adjustment of accounts, the former under pressure of particularly serious economic developments and political disturbances which threatened the stability of the currency, and the latter in an endeavor to make effective its return to the gold standard earlier in the year. Other nations have sent us gold in minor amounts, which aggregate a fairly usbstantial total. To France, on the other hand, the United States shipped considerable gold ($74,000,000), adding to the already excessive gold holdings of that country. In all, imports of gold into the United States for the first nine months of 1930 amounted to $287,000,000, against exports of $102,000,000. An additional $21,000,000 was also released by foreigners to Americans from the former's earmarked stocks held with American banks. The total net loss of foreign gold to this country, therefore, was $206,000,000, or the practical equivalent of the entire stock of new gold produced in 1930 for monetary purposes.

CONCLUSIONS

Importance of Capital Exports.—No one familiar with the facts could assert that our merchandise exports in the aggregate could have maintained the high level of recent years and their excess over imports without the offsetting factor of our large capital exports to foreigners. Without them, other nations could not have acquired the resources to adjust the merchandise balance against them, and met the growing volume of contractual payments due Americans on accumulated capital debts, our purchases of foreign goods and services being what they were. With our new tariff act furnishing a still higher barrier to imports, a large net export of capital becomes increasingly important, unless our merchandise export volume is to decline eventually to a level near that of our merchandise import volume. A recognition of these facts is not confined to academic circles. In a review of our international balances for 1929, the Secretary of Commerce stated: "The most important event in our foreign dealings was a reduction of $561,000,000 in our capital exports (to $373,000,000)." To be sure, 1929, registering the peak of a world trade cycle, was an abnormal year; but the attraction of gold to this country from a number of important financial markets probably was a substantial factor in accentuating the financial stringency which occurred in practically all countries, and unquestionably contributed to the severity of the subsequent depression.

Foreign Trade and the Gold Standard.—The year 1930 has also been a highly critical year, with many severe tests thrust upon the gold standard as it has been re-established in most debtor countries in the post-war period. The drop in world prices has meant an increased burden upon such countries, and the decline in international trade has contributed gravely to their fiscal and economic problems. As those countries have all become debtors of the United States in recent years, they are compelled to turn to American markets for new capital to relieve their temporary difficulties. But American capital markets—confronted with foreign political disturbances and severe economic depression abroad, and declining security values, both foreign and domestic, at home—have become reluctant to make additional capital commitments beyond our boundaries.

The Capital Export Balance.—An important question arises, therefore, as to whether the United States has effectually decreased its net capital exports in the present year. Fortunately, the fact that we have only a bare outline of separate capital items (enumerated above) on which to base a judgment need not deter us from a rough statistical view. Dr. Ray Hall, of the Department of Commerce, has pointed out that since merchandise, gold and capital are the main variants in our international trade (see AMERICAN YEAR BOOK, 1929, p. 430) it is possible to obtain an approximate figure for the net change in our capital exports between any two periods. Without tracing the computation completely (save to note that it took account of a belated payment of $74,000,000 by the American Government to German shipowners for property confiscated during the war), it is sufficient to say that the results show a reduced net capital export balance of some $21,000,000. Figured recently in a more direct way, by Dr. Ray Hall, a decrease of some $65,000,000 for the year is indicated.

Whichever figure is the more nearly accurate, it is clear that for the second consecutive year our net export of capital has declined, though less this year than last. When it is recalled that the net export of capital in 1929 was estimated to be only about $373,000,000, it becomes clear that the balance for the present year must be small indeed when compared with the net capital exports of 1927 and 1928. How permanent the contraction of America's net capital exports may be no one can tell, but it is altogether certain that should such a contraction continue, shifts in our other items of commodity trade must occur. In addition, the series of foreign tariff increases, recently legislated by eight countries in all, and following close on the heels of the enactment of our own new tariff act, cannot fail to influence the volume and course of trade in the immediate future.

CONDITIONS OF INTERNAL COMMERCE

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BASIC PRODUCTION

Curtailed Output.—A condition of world-wide economic disturbances in 1930 was reflected in curtailed production of major products in the United States. A study of the Federal Reserve Board's index of industrial activity for this year as compared with 1929 shows a drop of nearly 20 per cent in production of basic minerals and important manufactures. However in 1929 manufacturing industries not only broke all previous records in quantity of output but rose approximately 20 per cent above the volume reported in 1923 which was regarded as an active year. Compared with the highly prosperous year of 1928 production in 1930 declined about 13 per cent.

Summary for Major Groups.—For the first ten months of 1930 total production of automobiles was 3,071,869 as compared with 3,867,503 for corresponding months in 1928. The high record for 1928 was surpassed in

1929 by approximately 27 per cent and, as might be expected, this industry operated in 1930 at a relatively low rate of activity. In cumulative totals for the year production in steel ingots and pig iron declined 26.8 per cent and 24.6 per cent respectively, and copper dropped 26.8 per cent from the abnormally high level of production in 1929. Coal, cotton textiles, industrial machinery, leather goods, and newsprint paper all added to the general record of curtailed production. Slight increases over 1929 production were reported within the chemical group.

Construction for public works and utilities, reported in 1930, showed a cumulative value of 8 per cent greater than for the corresponding period in 1929. This activity resulted largely from an emergency program brought about by the White House conferences and served partially to offset the tremendous decline in construction, of residential buildings. The total value of all classes of construction, reported for the first eleven months of 1930 was $4,275,223,600, a decrease of 21 per cent from the total reported for the corresponding months of 1929.

EMPLOYMENT AND LABOR CONDITIONS

The decreased volume of industrial production was accompanied by increased unemployment. Factory employment was about 15 per cent below the high average for the previous year with a corresponding drop in payroll totals. A decline in quantity of export trade of about 20 per cent below last year's record, and a period of severe drought contributed to still further unemployment. Though the previously mentioned increase in public works and highway construction projects is credited with providing work for about 200,000 of the otherwise unemployed, construction in general and railroad transportation activities fell in labor demands as a result of decreased operations. In the light of these statistics and data 1930 stands out as remarkable in its almost total absence of industrial disputes. There have been no conspicuous labor disturbances such as have arisen in previous periods of depression. Business and labor leaders made strenuous attempts to keep their working forces intact and coöperated in efforts to alleviate depressed conditions by distributing part-time work and by avoiding wage cuts to the extent that was possible.

PRICES, COST OF LIVING AND PURCHASING POWER

The price declines which occurred in 1930 were the inevitable outgrowth of the general depression and contributed to greater instability and depression as the year advanced. Industry anticipated a downward trend in raw material prices and developed restricted buying policies. Wholesale commodity prices averaged nearly 10 per cent below the 1929 level. Low prices to agricultural producers prevailed for the current year although crop production averaged below normal. Price declines and other factors previously enumerated combined to bring heavy losses in purchasing power. Imports, comprised largely of raw materials, semi-manufactured goods and foodstuffs, fell about 30 per cent in value and about 15 per cent in volume as compared with 1929. The fall in the cost of living index which accompanied price declines showed cost of living at the close of the year to be about 6 per cent below the level for 1929.

CREDIT AND FINANCE

Indications of business recovery which appeared during the early months of 1930 were followed by cautious borrowing and spending. There was an abundant supply of funds at low rates in interest, and rates declined as the year advanced. Savings deposits maintained a high average and total sales of life insurance policies almost equaled the high level for 1929. Loans and discounts of Federal reserve member banks at the end of November were less than for that month of the preceding year. The Federal Reserve ratio was higher than in 1929. Bank debits for the closing months of the year show a decline from a corresponding period of a year ago. Prices for stocks listed on the New York Exchange averaged lower in November than for the same month last year and continued to decline in December. Broker's loans were liquidated during the year by about 40 per cent and Federal Reserve member banks diminished their indebtedness to the Federal Reserve Banks by approximately 80 per cent. The close of the year found the banks of the country in general in a strong position.

DISTRIBUTION MOVEMENT

Freight.—Primary distribution as measured by freight car loadings decreased perceptably in 1930 as reported in the Survey of Current Business. For the first eleven months of the year 38,976,434 frieght cars were loaded with all types of commodities as compared with 44,599,437 carloadings in 1929. Declines in wholesale trade were noted in all lines when compared with the large volume in 1929.

Store Sales.—Available reports indicate that consumer buying has maintained relatively high levels. Preliminary figures from the Federal Reserve Board show that department store sales were only 7 per cent smaller for the first eleven months in 1930 than for the same period last year. About half of this decline can be attributed to lower price levels. The value of merchandise stocks held by department stores were reported as considerably lower than at the close of last year. Sales by principal chain stores and mail order houses at the end of November were smaller in dollar volume than for 1929. Lower prices accounted to a large extent for this decline in value of sales. Retail distributors reported an exceptionally large volume of sales of Christmas "luxury goods" which indicated general confidence in returning prosperity.

THE BUSINESS OUTLOOK

Possibly a far-reaching and constructive result of the business depression in 1930 will come from the coöperative spirit in which business and industrial leaders and economic authorities sought to uncover causes of the unsatisfactory condition and remedies to safeguard the future. Analyses have progressed beyond the stage where the previous wave of speculation or any one factor of so recent occurrence can be singled out as the cause. The realization that there is need to find and remedy the weakness in our industrial marketing system, which made possible a prolonged sharing of the world-wide depression, may produce practical measures and successful accomplishments in the "maintenance of an economic balance" which have been lacking in an otherwise sound economic structure.

The financial resources of the United States have proved adequate to meet a serious depression, and the intelligence of the people has proved sufficient to avert disturbances which turn depression into panic. The close of 1930 finds the banks in a strong position, as previously indicated; buying on an upward curve; weak members eliminated from business; and a constructive mental attitude toward profiting from experience. There are indications of national confidence that necessary adjustments will be made and that prosperity on a sounder basis will be gained. This confidence in itself goes a long way toward justifying the prediction of many economists that a definite return to better business will be achieved in 1931.

RAILROADS

By R. H. Aishton

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CONSOLIDATION

The Interstate Commerce Commission, Dec. 9, 1929, issued a final plan for the consolidation of the railway properties of the United States into a limited number of systems. This action by the Commission was pursuant to Section 5 of the Interstate Commerce Act and is a matter on which the Commission had been at work for almost ten years. Repeatedly, in its annual reports, the Commission had asked Congress to relieve it from the duty of promulgating a final plan but finally, despairing apparently of relief from Congress, decided to carry out the provision of the law. As a result the railroads of the country are allocated to twenty-one systems, including a combination of railroad properties of the Canadian National and of the Canadian Pacific located in the United States. Terminal properties were not dealt with in the decision.

RATE DECISIONS

Western Trunk Lines.—Three important rate decisions were handed down in 1930 by the Interstate Commerce Commission. May 6 a decision with respect to the western trunk line class rates, a part of the general Hoch-Smith Resolution investigation, was made public by the Commission. It found that the general level of class rates in the western trunk line territory was relatively low and an increase in them justified. The Commission further found that these railroads needed additional revenues and that the traffic could bear increased rates. This broad decision has greatly disrupted rate relationships in the western territory and has aroused criticism. It has been estimated that the decision would give about $10,000,000 in increased revenues to the western carriers.

Eastern Rate Case.—The Commission on May 10 decided the eastern class rate case, applying further its principle of a mileage basis for rates and increasing the number of classifications. To this decision also an objection has been made on the ground that the increased rates on the lower classes, for instance Class 5 and Class 6, would tend not to increase the revenues of the carriers but to divert traffic to the highways.

Grain Rates.—A third important decision was made by the Commission July 1, 1930, on grain rates in western territory for interstate movement and for export. This decision made a reduction in the grain rates to such an extent that it is estimated that a loss of $20,000,000 will result to the western carriers.

Application of Rates.—The Supreme Court handed down a decision June 2 with respect to the application of rates made under the Hoch-Smith Resolution adopted by Congress June 30, 1925, and intended to reduce the rates on agricultural commodities due to the depression in that industry but interpreted to apply generally to depressed industries. This decision of the Supreme Court interprets that Resolution to the effect that no new principle of rate making has been pronounced through it by Congress and that the Commission's construction of the Resolution was erroneous. The order of the Commission, in the opinion of the court, was based upon an erroneous construction of the Hoch-Smith Resolution "and therefore should have been set aside by the court below."

CAPITAL EXPENDITURES

Early in November, 1929, the President called into a conference a number of railway executives and through them asked the railroads of the country to continue their capital expenditure programs despite the decline in stock market prices and the resulting business depression. In response to this request the railways agreed to continue capital expenditures with the result that Class I railroads in the first six months of 1930 had total capital expenditures of $468,305,000 for new equipment and additions and betterments to railway property, an increase of $118,000,000 over expenditures for the same period in the preceding year.

DROUGHT RELIEF RATES

At the request of the President the railroads of the country applied to the Commission for special tariffs which contained emergency drought reduction rates on feedstuffs and water for cattle and livestock in drought-stricken areas and applying to livestock moving out of these areas. These reductions amounted to 50 per cent of the existing rates in the eastern and southern territories and 33⅓ per cent in the western territory. The original tariffs limited the time for application of these rates to Oct. 31 but later were extended by request of the President to Nov. 30. In excess of 60,000 cars moved under the permit system devised for the application of these rates, the Department of Agriculture, through its county agents and other representatives determining the drought areas and the distressed farmers deserving of these emergency drought rates. Loss in freight revenues to the rail carriers from these reduced rates was several million dollars.

COÖRDINATION OF RAIL AND HIGHWAY TRANSPORTATION

The situation with respect to the relationship of highway transportation to rail transportation directed the attention of the Interstate Commerce Commission to this question. On their own motion they instituted a nation-wide investigation on the coordination of rail and highway transportation service. A series of hearings on this subject, beginning Nov. 17 and closing March 4, is being held by the Commission.

RAILROAD FACILITIES

Mileage.—The average miles of road operated by Class I rail carriers in the United States (those with gross incomes of $1,000,000 or more) excluding switching and terminal companies, were 239,006 miles in 1928 and 239,544 in 1929. The total track mileage of all railways in 1928 was 427,750 and in 1929 was 429,054. The Class I carriers of the country operate about 92 per cent of the total mileage and, due to the long haul service which they perform, about 97 per cent of the total revenues is received by them.

Cars and Locomotives.—Class I railways in 1928 had in service 53,097 passenger cars and in 1929, 52,259 cars. The number of locomotives in service on Class I railroads in 1928 was 59,470 and in 1929 was 57,537. While in actual number the locomotives in service has decreased, the average tractive power per unit has increased. This increase in average tractive power has characterized the steam locomotive for many years. In 1911 the average tractive power of locomotives was 28,305 pounds; in 1920, 36,365 pounds; in 1925, 40,666 pounds, and in 1929, 44,798 pounds. From 1911 to 1925 the actual number of freight cars owned by Class I railways in the United States steadily increased. The total number of these cars in 1911 was 2,117,644. In 1925 the number was 2,357,234, which marks the peak of ownership. Since 1925 there has been a steady decrease in the number of such cars as shown by the table below:

Year	*Number of Cars*
1925	2,357,234
1926	2,348,679
1927	2,324,834
1928	2,297,589
1929	2,277,464

Carrying Capacity.—While there has been this decrease in the number of freight car units, at the same time there has occurred an increase in carrying capacity per unit. For example, the average capacity per car in 1925 was 44.8 tons. The average capacity in 1928 was 45.8 tons and in 1929 was 46.3 tons. It thus appears that the older type of smaller capacity freight cars is being displaced by new equipment of greater unit capacity.

RAILROAD FINANCES

Property Investment.—The total property investment in road and equipment of Class I railways, excluding switching and terminal companies, in 1928 was $24,259,638,945. In 1929 the total property investment was $24,884,674,485. Materials and supplies in 1928 amounted to $471,077,760 and to $470,072,929 in 1929. Working capital or cash on hand amounted to $502,833,359 in 1928 and in 1929 to $515,375,569.

Improvements.—Gross capital expenditures of Class I railways during the past eight years for improvements aggregate $6,298,381,000. Gross capital expenditures for 1929 were $853,721,000. Expenditures made by

Class I railways during the first six months of 1930 for new equipment and additions and betterments amounted to $468,305,000. This amount shows an increase of $118,000,000 over similar expenditures for the first half of 1929 and demonstrates the extent to which the railroads of the country, through the purchase of new equipment and improvements to their property, cooperated with the President in maintaining employment and business progress. The capital expenditures for the eight-year period when analyzed show $2,965,185,000 invested in locomotives, freight and passenger train cars and other equipment. The amount invested during this period in roadway and structures was $3,333,196,000. For the past eight years capital expenditures have averaged slightly over 52 per cent to roadway and structures and slightly over 47 per cent for equipment.

Employees and Wages.—The number of employees on Class I railways, excluding switching and terminal companies, was 1,656,411 in 1928 and 1,660,920 in 1929. The total amount of compensation to these employees in 1928 was $2,826,590,471 and in 1929 was $2,896,566,291. The average hourly compensation per employee was $0.655 in 1928 and $0.666 in 1929. The average annual earnings per employee in 1928 were $1,706.45 and in 1929 were $1,743.95.

RAILROAD TRAFFIC

Freight.—The total freight revenue received by Class I carriers, exclusive of switching and terminal companies was $4,691,147,326 in 1928 and $4,825,622,121 in 1929. For the eight months ended Aug. 31, 1930, total freight revenues were $2,744,468,532 as compared with $3,186,785,711 for the same period in 1929, marking a reduction in freight revenues of 13.9 per cent. The average receipts per ton mile in 1928 were 1.081 cents and in 1929 were 1.076 cents. The average length of freight haul in 1928 was 183.33 miles and 182.46 miles in 1929. Total revenue tons carried by Class I railways in 1928 were 2,361,622,636 and 2,451,601,084 in 1929. The revenue ton miles of these carriers in 1928 were 432,915,184,526 and in 1929 were 447,321,561,129. Tons per loaded car originated were 35 in 1928 and 35.5 in 1929, exclusive of less than carload merchandise.

Passenger.—The total passenger revenues of Class I railways, excluding switching and terminal companies, were $902,329,865 in 1928 and $873,564,246 in 1929. The average revenue received from each passenger on the basis of the individual railways was $1.14 in 1928 and $1.12 in 1929. The average journey per passenger on the basis of the individual railways was 39.99 miles in 1928 and 39.82 miles in 1929. The number of revenue passengers carried by Class I railways in 1928 was 790,327,447. The record shows a continued decline in the number of revenue passengers carried by Class I railways since 1920, in which year the number of revenue passengers carried was 1,234,862,048. In 1929 the number of revenue passengers carried was 780,468,302. The number of revenue passengers has, however, declined more rapidly than have the figures representing revenue passenger miles. In 1920 the revenue passenger miles were 46,848,667,987. In 1928 revenue passenger miles were 31,601,341,798 and 31,074,134,542 in 1929.

Service.—The rail carriers have continued to maintain the high level of transportation service which has characterized them during recent years. This service is due primarily to the large capital expenditures which the carriers have made since 1922. A second important factor is the cooperation among carriers themselves and between shippers and carriers. The result has been that car shortages are considered now to be a thing of the past. The millions of cars, however, are not distributed to serve the particular needs of individual shippers without planning and foresight and without someone being forever in touch with the requirements. There are such special demands as box cars for wheat, refrigerators for perishables and coal cars. In order that the rail carriers may be in closer contact with the needs of shippers in respect to car service, there have been organized thirteen shippers regional advisory boards covering, by districts, the entire country. Through these boards there has been achieved a splendid cooperation between shippers and carriers in the matter of car service. The membership of these boards aggregate more than 15,000.

REVENUES AND EXPENSES

Operating Revenues.—The total operating revenues of the Class I railways, excluding switching and terminal companies were $6,111,735,511 in 1928 and $6,279,520,544 in 1929, including approximately $37,000,000 of mail pay applicable to the years 1921 to 1928. For the first eight months of 1930 total operating revenues were $3,615,071,416 for Class I railways, including large switching and terminal companies, as compared with $4,213,688,666 for the same period in 1929. This marks a decrease in total operating revenues as between these two periods of 14.2 per cent.

Operating Expenses.—Total operating expenses of the Class I railways, excluding switching and terminal companies, for 1928 were $4,427,995,036 and $4,506,056,262 in 1929. For the first eight months ended Aug. 31, 1930, total operating expenses for Class I railways, including large switching and terminal companies, were $2,732,292,415 as compared with $3,035,101,917 for a similar period in 1929, a decrease of 10 per cent.

Net Railway Operating Income.—The net railway operating income for Class I railways, excluding switching and terminal companies, was $1,172,864,100 in 1928 and $1,251,697,938 in 1929. For the eight-month period ended Aug. 31, 1930, the net railway operating income, including large switching and terminal companies, was $555,302,117 as compared with $828,394,791 for the same period in 1929, a decrease of 33 per cent.

Operating Ratio.—The operating ratio for Class I railways, excluding switching and terminal companies was 72.45 per cent in 1928 and 71.76 per cent in 1929. For the period of eight months ended Aug. 31, 1930, the operating ratio of the Class I railways and large switching and terminal companies was 75.58 per cent as compared with 72.03 per cent for a similar period in 1929.

Taxes.—The railway tax accruals for Class I railways, excluding switching and terminal companies for 1928 were $389,432,415 and for 1929 $396,682,634. For the eight-month period ended Aug. 31, 1930, tax accruals for Class I railways and large switching and terminal companies were $244,889,276 as compared with $270,647,132 for a similar period in 1929. Of these taxes the Class I railways paid to the Federal Government on income and other taxes $89,277,354 in 1928 and $90,690,857 in 1929.

Rate of Return.—The rate of return on investment in road and equipment of Class I railways, excluding switching and terminal companies, including materials, supplies and cash on hand, for 1928 was 4.65 per cent and 4.84 per cent for 1929. For the first eight months ended Aug. 31, 1930, the rate of return was 3.59 per cent as compared with 5.48 per cent for the same period in 1929.

PURCHASES AND MAINTENANCE

Fuel.—Taken as a whole, the railways represent probably the largest single customer among the basic industries of the country. They purchase annually about 25 per cent of the total bituminous coal production and, in addition, about 5 per cent of the total anthracite production in the United States. Their further fuel requirements include over 19 per cent of the total fuel oil output.

Timber and Steel.—Directly and indirectly, the railroads consume above 20 per cent of the total timber cut of the country and approximately 17 per cent of the total iron and steel production. The fuel bill of Class I railways in 1929 amounted to $364,392,000. Their direct purchases of forest products equalled $157,551,000. Expenditures for iron and steel products equalled $437,840,000. The grand total of their purchases for 1929 was $1,329,535,000.

Maintenance Expenditures.—Total expenditures by Class I railways, excluding switching and terminal companies, for maintenance of way and structures in 1928 were $837,905,747 and $855,354,867 in 1929. The total expenditures of these same carriers for maintenance of equipment were $1,166,941,920 in 1928 and $1,202,912,246 in 1929. The percentage of freight cars awaiting repairs on Oct. 1, 1930, was 7.1 per cent of the total number and of locomotives awaiting classified repairs at the same date 8.6 per cent. Locomotives in storage at the same date numbered 7,997 as compared with 4,500 in 1929.

RAILROAD COMPETITION

Buses and Highways.—There has been a further extension and a further intensification of competition with the railways by motor vehicles on improved highways. In 1929 there were 92,500 motor buses in operation in the United States. It is estimated that these buses created 10,835,000,000 revenue bus passenger miles during the year. The number of passengers carried in inter-city service is estimated at 422,000,000. The number of motor trucks registered in 1929 was 3,379,854. The registration of passenger cars for 1929 was 23,121,589. The total mileage of highways surfaced at the end of 1929 was 660,000 miles, of which 210,000 were state highways and 450,000 local roads. The total road mileage surfaced in 1929 was 50,000. During 1929 78 steam railroads operated 2,389 buses and in the same period 55 railroads operated 5,900 trucks, exclusive of the 9,759 trucks operated by the Railway Express Agency.

Waterways.—Competition with railroads by water transportation has continued during the year. The Inland Waterways Corporation, a Government owned, subsidized and operated barge line, extending from Birmingham, Ala., via Mobile, New Orleans and St. Louis, to the Twin Cities has expanded its equipment by expenditure of a part of the new capitalization created for it by the Denison Act of 1928. The rail carriers are in the process of establishing through routes and joint rates with this barge line from an extended territory. A new private common carrier has begun operation on the Ohio and Mississippi Rivers. Privately owned and operated barge lines have continued their service.

Airplanes have continued their operation of air-mail routes under the fostering care of the Government. A continued annual loss of more than $10,000,000 is suffered by the Government on the basis of its contracts with airplane carriers for handling the mail.

HIGHWAYS AND MOTOR ROADS

By Thomas H. MacDonald

Chief, Bureau of Public Roads, Department of Agriculture

RURAL ROADS

Mileage.—According to the best available estimates there were 3,024,233 miles of public roads in the United States Jan. 1, 1930. It includes roads of all classes outside the limits of municipalities, and is made up in very large part of local roads of small importance, many of them mere right of ways established by law along each section line in the states of the middle west. The roads which accommodate by far the greater part of the rapidly-growing traffic of motor vehicles are comparatively limited in mileage and, in the main, are included in the Federal-aid or state highway systems, although the more important county and local roads, especially in metropolitan areas also accommodate a very considerable and growing traffic.

Federal-Aid Roads.—The Federal-aid system which includes, as a whole, the roads of highest traffic importance, was designated jointly by the Federal and state highway authorities following the passage of the Federal Highway Act in 1921. This system which was originally limited to 7 per cent of the total highway mileage of record at the time the law was enacted, may now be increased by an amount equal to the mileage of the designated system in each state lying within the boundaries of national forests, Indian reservations, and other Federal reservations. The designated system now includes 193,049 miles.

State Roads.—In most instances the roads selected for inclusion in the Federal-aid system have also been designated by the states as units in the several state highway systems, but these later systems are the most extensive, including in addition to the Federal-aid sections others which are not included in the Federal scheme. In the aggregate these systems of the states included 314,136 miles on Jan. 1, 1930.

Local Roads.—All roads not included in one or the other of the foregoing main systems are county or local roads, and with few exceptions are of less importance than Federal-aid and state roads. The mileage of roads of this general class Jan. 1, 1930, was approximately 2,710,097 miles.

ROAD IMPROVEMENT

Federal Participation.—All roads included in the Federal-aid highway system are eligible for improvement with Federal monetary aid. The improvement is carried out under the immediate direction of the state highway departments subject to the approval of the Federal Bureau of Public Roads, acting for the Secretary of Agriculture, who is charged with the administration of the Federal Highway Act, and any amount not exceeding 50 per cent of the cost, or $15,000 per mile, may be paid by the Federal Government. This is the general limitation and provision is made for increasing both the rate of Federal participation and the maximum payment per mile in the public land states in proportion to the area of unappropriated public land. Upon completion of the original 7 per cent system in any state, Federal participation may be increased to $25,000 per mile under certain conditions. On Oct. 31, 1930, the roads of this system which had been improved with Federal assistance reached a total of 86,074 miles, and on the same date other roads aggregating 11,047 miles were under construction, and 2,190 miles had been approved for construction in the immediate future, making a total of 99,311 miles already improved or in course of improvement with Federal aid.

State Construction.—The states have done considerable improvement of the Federal-aid system without assistance. Recent figures on the work thus done are not available but one year ago it was estimated that nearly 90 per cent of the total designated mileage had been initially improved and approximately 65 per cent of the entire mileage had been surfaced with materials varying, according to the needs of traffic, from mixtures of sand and clay constituting so-called sand-clay surfaces to the most durable types of pavements. The state highway systems which, as previously stated, are coincident with, but more extensive than the Federal-aid system, are improved as a whole, to nearly the same degree. On Jan. 1, 1930, the total of the 314,136 miles then embraced in these systems included 28,553 miles improved by grading and draining, and 208,324 miles of surfaced highways, the types of surfacing varying, as in the case of the Federal-aid system, from sand-clay to durable pavements.

TYPES OF SURFACED ROADS

Macadam and Concrete.—In each of the systems mentioned the surfaced roads are of various types, of which the principal are sand-clay, gravel, water-bound and bituminous macadam surfaces, and sheet asphalt, bituminous concrete, Portland cement concrete, and brick and other block pavements. Of these several types, the sand-clay, gravel and water-bound macadam with the unsurfaced but graded and drained roads are frankly regarded as temporary or transitory, to be replaced by a more durable type when traffic reaches a sufficient value to require and justify such replacement. The other types—bituminous macadam, sheet asphalt, bituminous concrete, Portland cement concrete, and brick and other block pavements—are classified as durable, and are suited to the needs of heavy motor traffic.

CLASSIFICATION OF HIGHWAYS BY TYPE
(as of Jan. 1, 1930

Type	State Highways	Local Roads	All Highways
	Miles	Miles	Miles
Unimproved and partly graded........	77,259	[1]2,255,986	2,333,245
Graded and drained..................	28,553	[1].........	[1]28,553
Sand-clay and topsoil................	15,442	75,547	90,989
Gravel, treated and untreated.........	97,838	292,463	390,301
Water-bound macadam, treated and untreated	19,931	48,760	68,691
Bituminous macadam	14,043	16,692	30,735
Sheet asphalt	1,498	1,539	3,037
Bituminous concrete	5,722	4,057	9,779
Portland cement concrete.............	50,584	13,254	63,838
Brick and other block pavements......	3,266	1,799	5,065
Totals	314,136	2,710,097	3,024,233

[1] Graded and drained local roads have been included with unimproved and partly graded roads because of lack of data.

CONSTRUCTION AND MAINTENANCE

Mileage.—During 1929 there was a total of 78,003 miles of road built on the state and local road systems, of which the surfaced portions amounted to 54,875 miles. Of these totals 32,522 miles, including 25,071 miles of surfaced roadways, have been constructed by the states with and without Federal aid, and 45,481 miles, of which 29,804 miles have been surfaced, have been built by the county and local governments. The Federal-aid road construction during the fiscal year ending June 30, 1930, totaled 9,349 miles including 6,893 miles of surfacing.

Expenditures.—Since 1921 the annual expenditures for all rural road construction and maintenance have exceeded $1,000,000,000 a large and increasing proportion of which is provided by the taxes levied on motor vehicles and motor fuel. Large as it is, this expediture is only half the annual expenditure by owners of motor vehicles for gasoline alone. In this fact there is a suggestion of the reason for the public approval and economic wisdom of the highway expenditures, since the money thus invested results in a reduction of the cost of gasoline and other operating expenses of motor vehicles which demonstrably exceeds the expenditure. In 1929, the most recent year for which complete statistics are available, the expenditures of the state highway departments (including Federal aid) amounted to $864,693,917; those of the counties and other local governments were $750,825,421. These expenditures are classified according to their purpose as follows:

By state highway departments:[1]	
Road and bridge construction	$557,400,625
Road and bridge maintenance	173,060,321
Interest and principal on bonds	88,218,909
Equipment and miscellaneous	46,014,062
Total	$864,693,917
By counties and other local governments:[1]	
Road and bridge construction	256,581,811
Road and bridge maintenance	260,477,801
Interest and principal on bonds	184,309,850
Miscellaneous purposes.....	49,455,959
Total	$750,825,421
Grand total	$1,615,519,338

[1] Does not include $45,791,374 transferred by states to counties and $56,889,183 transferred to states by counties.

MOTOR HIGHWAYS

Travel Volume.—During 1929, according to information received from the states, the consumption of gasoline by motor vehicles amounted to approximately 14,200,000,000 gallons and it is estimated that the total for 1930 will exceed 15,000,000,000 gallons, which at 12 miles per gallon (the approximate average consumption of vehicles of all makes and types) would indicate that the annual travel by motor vehicles amounts at present to over 180,000,000,000 vehicle-miles, an almost inconceivable figure. Yet large as it is it must be more than doubled to obtain a measure of the passenger-mileage for which the automobiles and improved roads and streets are responsible. This tremendous annual passenger movement by highway passed the rail movement some years ago and is now nearly 12 times as great.

Numbered United States Highways.—Of special interest to all owners of motor vehicles is the network of principal interstate and transcontinental highways, known as United States highways, designated in 1925 by agreement between the highway authorities of all states and the Federal Government. There are approximately 100,000 miles of such highways comprising the most direct and feasible interstate and transcontinental connections, and a plan has been adopted and is now in general effect, whereby the routes which compose this important network are uniformly designated by numbers and clearly marked with warning and danger signs in nearly all states.

Routes and Markings.—In this system, which is made up of the most important sections of the Federal-aid and state systems, there are approximately 180 routes, and such routes are marked, throughout their entire length in nearly all states traversed, by the same distinctive number, displayed on a white shield-shaped marker. All east-and-west routes are being designated by even numbers, the more important in multiples of 10, as 10, 20, 30, etc. The north-and-south routes are being designated by odd numbers, and the more important of these roads are being indicated by two-digit numbers ending in one or five, as 11, 15, etc. For the guidance of travelers all of these routes are being marked with standard direction and warning signs, which are readily distinguishable by their shape and color as well as by the warning and information printed upon them, and they thus indicate at a glance the nature of the danger to be avoided or the character of the information they carry.

Road Signs.—All danger and warning signs are composed of yellow background with black lettering. They are made in four shapes indicative of different degrees of danger. Thus, an octagonal sign is used to give warning of such extreme danger as to require a complete stop. A round sign is posted at all railroad crossings, diamond-shaped signs give notice of dangerous conditions as curves, steep grades, narrow bridges, etc.; and square signs are posted at points of occasional danger such as approaches to schools, churces, hospitals, etc. All directional and informational signs are white with black lettering, and all are rectangular in shape. Those calling attention to legal speed limits will be in the form of a vertical rectangle; all others will have their longer dimension horizontal.

MOTOR BUS SERVICE

By Carl W. Stocks

Editor, *Bus Transportation*

GENERAL PROGRESS

Tenth Anniversary. — America's fastest growing form of transportation—highway passenger travel by bus—celebrated its tenth anniversary in 1930. The popularity of bus travel has continued to grow and to hold a recognized place in the transportation world. Progress cannot be stopped merely because it injures an older form of transportation. This progress marks an economic development that is contributing to the prosperity and progress of the nation.

Passenger Traffic.—In 1929, figures indicate that almost 2,000,000,000 riders were handled. While passengers transported within the urban centers far outnumber those carried between cities and states, nevertheless it is the long-haul that has developed the greater earning power.

Expansion of Routes.—Today, the bus routes of the country reach practically every city in the United States. Many points in Canada are equally accessible, and an American-owned line taps some of the more built-up territory of Mexico. Through tickets can be purchased at any bus terminal. It is also now possible to travel from New York to Los Angeles either on buses of a single carrier or on buses of companies under a single holding company, situations not duplicated by the railroad industry even though it has had a century of operation.

Maintenance and Terminal Facilities.—A year ago mergers making for powerful bus systems and railroad interest in bus operation were noted as the outstanding developments. During the past year, while many consolidations have taken place, activity has been stressed in a totally different direction,—in passenger terminals and maintenance facilities in order to improve the service rendered. The value of adequate terminals as traffic builders and for holding patronage has come home to the motor carrier. Intensive research into methods of saving a fraction of a cent per mile of operation has brought about the investment of hundreds of thousands of dollars in scientifically equipped maintenance plants. At the close of 1929, investment in terminals and shops alone amounted to $110,000,000. When figures for 1930 are compiled, this figure will be materially increased. Preliminary estimates put this increase at 15 per cent. Investment in new terminals during 1930 will amount to more than $12,000,000, and in garages and shops $5,000,000, it is estimated from figures available in existing records.

Service Coordination.—Other developments during the year, which stand out as progressive forward movements, were the organization of traffic bureaus, schedule building and rate making, all of which have brought about a closer coordination of service between the several important bus systems which cover the country with a network of routes, in all 782,485 miles.

Operating Statistics.—At the close of 1929*, there were 23,928 operating companies of all classes as compared with 23,311 in 1928 and 22,611 in 1927. There were 92,500 buses in use as compared with 92,325 and 85,636 in the two previous years respectively. It is estimated that vehicles traveled 11,800,000,000 miles in transporting 1,768,000,000 persons, a distance of 10,835,000,000 passenger miles.

Earnings and Investment.—Earnings from passenger motor carriers amounted to $322,000,000 in 1929, an increase of $23,000,000 over the previous year. Total investment in rolling stock as of Jan. 1, 1930, amounted to $450,000,000, an increase of $10,000,00 over 1928.

GROWTH OF THE INDUSTRY

Company Expansion.—Growth of the industry as a whole over a period of years is aptly expressed in a tabulation listing fleets of more than 100 buses. In 1921 there were only two such companies. These owned 588 buses working on 380 miles of route. In 1928 there were 41 such fleets in operation with a total of 10,157 buses over 37,016 miles of route as compared with 43 fleets in 1929, with 11,998 buses on 71,353 miles of routes. Despite the loss of several large units through mergers, the end of 1930 is expected to show at least 47 companies in this group with a total of 12,300 buses and 72,900 miles of route. One reason for the increase in route mileage between 1928 and 1929 is attributed to the strides made in transcontinental operations.

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* Note:—In statistics quoted for 1929, not too much stress should be placed on the apparently narrow spread between 1929 and 1928 figures as compared with 1928 and 1927. Data was collected more accurately in 1929 and corrected for overly optimistic reports. This was impossible in previous years. Growth in most respects was every bit as broad between 1929 and 1928 as between 1928 and 1927.

Rolling Equipment.—New buses purchased and delivered for 10 months in 1930, as reported by six leading manufacturers, numbered 2,904 vehicles as compared with 3,536 in the like period of 1929. There is another reason, beside that of industrial depression, for this reduction,—the need for rolling equipment approaches a saturation point beyond which most of the new vehicles are for replacement rather than for entirely new enterprises or the opening of additional new route mileage.

City bus operation expanded remarkably between 1922 and 1929. The Middle West made the greatest gains. Total number of cities of 10,000 estimated population or more, having local bus service, increased from 192 in 1922 to 559 in 1929. Final tabulations for 1930 are expected to show a further substantial increase in this group. Cities whose sole means of local transportation is vested in buses increased from 15 in 1922 to 202 in 1929. Possibly 8 cities have entered this group during 1930. In 1929, 14 cities entered the all-bus group while in 9 others, local bus service was started in conjunction with local trolley service. There were 4,795 buses in local service on 1,563 miles of routes in 1922 and in 1929 the total number of buses increased to 12,305 on 8,642 miles of routes. For 1930, preliminary figures show 12,500 buses and 9,250 miles of route.

Long Haul Service.—Today, the long haul branch of the industry is at a new high point. More buses are in this service and traffic is likewise on the increase. There is also a wider public appreciation of its value and its possibilities. The calibre of the independent operator is improving and both the financial and moral responsibility of all carriers is steadily becoming better.

Railroad Buses.—Railroads operating buses in service outside cities increased from 62 in 1928 to 66 in 1929 and the number of buses in this class of service rose from 1,256 to 1,454. The rapid rate of expansion of the bus business by railroads during the year is indicated clearly by the increase in route miles—16,793 in 1928 and 25,236 in 1929.

Electric Railway Buses.—Total number of electric railways operating buses, either as substitutions for trolley lines or in feeder service, numbered 262 as of Jan. 1, 1930, and the number of buses engaged in this service was 11,256 as against 10,062 in previous year. Route miles operated were 22,399 as against 20,280 in 1928.

BUS INDUSTRY AND TAXATION

A fallacy exists and is being fostered by those who have lost business to the motor carrier, that buses do not pay their fair share of taxes for the use of highways, built and maintained at public expense. The average common carrier bus earns $7,750 and of this amount $560, or 7.23 per cent is paid in taxes. All other transportation agencies and public utilities paid out but 4.50 per cent of revenue; agriculture paid 2.50 per cent; mining, 2.40 per cent; trade and industry, 1.50 per cent, and manufacturing, 0.90 per cent. These percentages are based on payments made in 1928. Special taxes plus the gasoline tax paid in the same year by buses as compared with other highway users compare as follows: Interstate buses, $625; city buses, $565; intercity intrastate buses, $418; common carrier trucks, $303; private trucks, $49.80 and private automobiles, $21.70. The average tax paid by common carriers on each bus owned amounted to $475, as compared to $22.74 paid by the owners of all other users of the highway.

THE FARE SITUATION

The fare situation has stood out during the year. It is recorded that bus fares reached the lowest levels in the history of the industry. Part of the decrease was due to a closer application to maintenance and operating problems with a subsequent reduction in costs passed on to the public. Larger capacity vehicles have also played their part. Competition, however, with the railroads, especially in the Middle West during the summer months, was the primary cause. It appears that these differences are likely to be ironed out and that the coming year may see a deserving cooperative effort on the part of all competitors to adjust fares on a more stable and equitable basis.

REGULATION AND CONTROL

Legislation.—During the year a concerted effort was made to win from Congress some form of regulation and control of buses operating in interstate commerce. The Parker Bill, (H. R. 10,288) passed the House of Representatives afer many weeks of investigation and debate. Federal control of interstate buses through the Interstate Commerce Commission remained in the Senate, when Congress closed, as unfinished business. It was due for further consideration at the short session in December.

National Association Action.—In line with this present, more or less chaotic, regulatory condition in the industry, the National Association of Motor Bus Operators at its fourth annual meeting in September adopted a set of self-imposed regulatory measures with a view toward greater uniformity in practices throughout the industry.

MERGERS

Pennsylvania Greyhound Lines.—Important mergers during the year, although considerably less in number than in the past two years, were of noteworthy increase in magnitude and investment represented. Leading the field was the arrangement agreed upon by the Pennsylvania Railroad and the Greyhound Lines in which both companies contributed bus lines from Chicago and St. Louis eastward to the Atlantic to form the Pennsylvania Greyhound Lines, Inc., a holding company with an investment of $6,000,000. The railroad and the bus company each control 50 per cent of the voting power.

Colonial Stages.—Another merger made known was the acquisition of Atlantic Pacific Stages by Colonial Stages, Cincinnati, for $1,000,000. This merger brings about a coast-to-coast system and a network of routes from the Gulf to Chicago. This network also has an interline agreement with the Reading Railroad and the Central Railroad of New Jersey whose buses tap the New York, Philadelphia and New Jersey shore resort territory.

Pending Consolidation.—Yet to be finally settled is a $5,000,000 consolidation of interests in eight southeastern states, the only geographical section of the country not yet dominated by a large syndicate of routes under one management. Concerned in this merger are Greyhound, Pickwick Greyhound Lines, Union Transfer Company, Consolidated Coach Company, and Smith Motor Coach Company—all operating lines south of the Ohio River and east of the Mississippi River.

Union Pacific Purchase.—The Union Pacific Railroad earlier in the year, through its bus subsidiary, bought five intermountain companies, thus strengthening the parent company's position between the plain states and the Pacific Coast.

ELECTRIC RAILWAYS

By John A. Miller, Jr.

Editor, *Electric Railway Journal*

GENERAL

In 1930 the electric railway industry showed noteworthy stability in the face of general business depression. While volume of traffic was below that of 1929 due to widespread per cent less than for the correspond- industrial unemployment, the decrease was small compared with that in many other industries. For the first six months, the number of passengers carried was approximately 5 ing period of 1929. For the second six months the decrease was somewhat greater. Preliminary figures for the year as a whole indicate that traffic was about 7 per cent below that of the preceding year. To some extent the railways were able to offset the decrease by economies in operation but not sufficiently to preserve net revenues at the 1929 level, despite a slight increase in the average fare.

ELECTRIC RAILWAY STATISTICS

Classification.—Physical statistics of the electric railways as of Jan. 1, 1930, are presented in an accompanying table together with data for the electrified steam railroads. No definite line of demarcation can be drawn between these two because many of the electrified steam railroads render service that is essentially the same in character as that of the interurban electric railways. For that reason the data on track mileage, rolling stock, etc., have been combined in the table.

Mileage and Equipment.—Electrified track mileage showed a slight decrease during 1930 due principally to the abandonment of a number of nonpaying interurban lines. Inauguration of electric suburban service by the Lackawanna Railroad added a substantial amount to the total electrified track mileage. Street railway extensions were made in several cities but the total mileage added was somewhat less than the mileage of abandonments. No marked change occurred in the total number of cars operated. Several hundred new street cars were placed in service during the year, notably in Baltimore and Detroit. The Lackawanna added more than a hundred electric suburban cars. On the other hand, a considerable number of old electric cars were retired from service so that the total remained about the same.

In Large Cities.—Approximately 60 per cent of the electrified track mileage, not including electrified steam railroads, and 80 per cent of the electric railway cars are to be found in cities of more than 50,000 population and in the suburban communities immediately adjacent. According to the U. S. Census of 1930 there are 189 such cities. In all but one the electric railway is the backbone of the local transportation system and in the one city where electric rail service has been suspended, there is lively agitation for its restoration. To supplement rail service the electric railways operate buses in 167 of these cities and trolley buses in about twelve. During the past decade the combined rail, bus and trolley bus facilities of the electric railways in these 189 cities have increased approximately 20 per cent, due largely to the development of bus and trolley bus service. The change in track mileage during this period has been less than 1 per cent.

In Small Cities.—In the smaller cities ranging from 10,000 to 50,000 population the growth of public transportation facilities has been less. The Census of 1930 shows 789 cities in this class, of which 531 have electric railways service. Among those which do not have rail service a considerable number have bus service. In some instances this is furnished by the same companies which formerly operated street cars, while in other instances bus operation is under independent auspices.

Trolley Bus.—Extension of trolley bus operation has been a noteworthy feature of the past year. At present approximately 60 miles of route are in operation. The total number of vehicles is slightly more than 200. All the existing trolley bus installations have been made during the past decade, a few earlier ones having been abandoned prior to 1920. While the present extent of this type of operation is comparatively small there are many indications that the next ten years will see a substantial expansion.

Taxicab Operation.—In about a dozen cities the electric railways operate taxicabs as well as rail and bus service. According to the latest available figures, approximately 2,500 taxicabs are operated under electric railways auspices out of a total of 65,000 in the group of 189 large cities mentioned. While the desirability of coordinating the taxicab with other forms of public transportation has long been evident, the lack of adequate regulation has tended to deter established transportation companies from entering this field. Recently there has been a growing tendency to classify taxicab service as a public utility. When this is done, it is likely that the electric railways will expand their activities in this field.

OPERATING BUDGET

At the beginning of 1930 the electric railways were planning to spend almost $375,000,000 during the year for extensions, betterments and maintenance. Of this total, approximately $125,000,000 was planned for way and structures, $68,000,000 for rolling stock, $40,000,000 for buses and $20,000,000 for power equipment. Expenditures totaling $120,000,000 were planned for maintenance work. During the first half of the year these plans were closely adhered to, but during the second half, decreased revenue necessitated certain curtailments.

FARES

Increase.—Through the year a steady increase occurred in the average cash fare which, in January, stood at 8.44 cents. By the middle of the year it had risen to 8.48 cents and by the end of the year to about 8.55 cents.

Rate Decision.—Of far-reaching importance to the electric railway industry was the decision of the U. S. Supreme Court in the rate case of the United Railways and Electric Company of Baltimore. In its decision the Court definitely established two important principles and reaffirmed a third which it had previously laid down. It held that the electric railway company was entitled to a return of 7½ to 8 per cent on its present fair value. It ruled that depreciation should be set up on a basis of "expenditures equal to the cost of the worn-out equipment at the time of replacement; and that this for all practical purposes means present value." Moreover the decision suggested, although it did not definitely state, that present reproduction costs must be considered the most important factor in determining valuation for rate-making purposes. As a result of the decision the railway was enabled to put into effect a straight 10-cent fare.

Cleveland.—An interesting experiment was made by the establishment of a two-cent fare zone in the downtown district. This low rate increased traffic to such an extent that the gross revenue was practically equal to that previously obtained in the same district with an 8-cent fare. Later the zone was lengthened and the fare increased to three cents. This advanced gross revenue to a point somewhat higher than that produced by the 8-cent fare.

FRANCHISES

The outstanding development of the year in the field of franchises was the ratification July 1 by a vote of nearly six to one of the new Chicago transportation ordinance calling for a comprehensive unified system of elevated lines, subways, surface cars and buses. In addition to the consolidation a city-wide program of extensions, additions and improvements has been mapped out. Expenditures of more than $200,000,000 are planned during the next ten years. Other results favorable to the electric railways were recorded in the November elections. Among these were the decision to extend for ten years the present method of public control of the Boston Elevated Railway, the granting of a new 25-year franchise to the Market Street Railway of San Francisco, and the revision of the California electric railway tax law.

CAR DESIGN

For several years past it has been realized that the key to the problem of the electric railways lies in the design of the car. While there has been general agreement concerning the need for rolling stock modernization, the progress actually made has been comparatively slow. To correct this situation a definite program was undertaken during 1930 under the auspices of the Presidents' Conference Committee, sponsored by a group of the leading electric railways. As the first step, the committee selected C. F. Hirshfeld, research engineer, Detroit Edison Company, to make a thorough analysis of present car designs and to develop plans for improvement. In this work the committee will have the backing of companies representing more than 60 per cent of potential car-buying power of the industry, and will also have the cooperation of the car builders

STATISTICS OF CITY AND INTERURBAN ELECTRIC RAILWAYS AND ELECTRIFIED STEAM LINES

(As of January 1, 1930)

	Number of Operating Companies	Miles of Track	Passenger Cars	Electric Locomotives	Freight Cars	Service Cars	Buses Operated	Miles of Bus Route
New England								
Connecticut	8	1,290.51	1,500	146	62	214	217	542.90
Maine	12	422.93	329	7	94	94	5	25.00
Massachusetts	25	1,912.67	4,061	6	35	752	713	1,131.87
New Hampshire	11	125.03	172	2	1	30	41	71.48
Rhode Island	3	301.74	594	3	15	113	164	160.60
Vermont	4	20.10	7	3	3	3	23	32.20
Eastern States								
Delaware	1	70.02	113	...	...	15	22	47.49
Dist. of Columbia	5	395.06	886	6	15	109	144	287.98
Maryland	5	667.75	1,433	3	123	148	231	1,602.14
New Jersey	13	1,164.16	2,779	...	5	327	2,458	3,184.75
New York	71	5,275.54	18,829	203	283	1,524	831	947.73
Pennsylvania	78	3,889.03	7,137	9	199	931	892	1,518.93
Virginia	13	677.30	745	16	17	82	247	171.43
West Virginia	10	635.34	365	19	53	54	128	642.05
Central States								
Illinois	49	3,245.18	7,302	80	2,875	766	463	1,371.73
Indiana	24	2,496.17	1,708	23	945	436	443	1,330.46
Iowa	23	984.32	657	39	1,049	193	150	1,089.18
Kentucky	7	495.49	802	...	24	126	84	77.21
Michigan	22	1,273.50	2,503	27	110	254	1,036	1,855.57
Minnesota	8	694.71	1,224	2	1	99	117	144.54
Missouri	14	1,152.26	2,467	5	36	338	179	248.56
Ohio	49	3,267,08	4,060	26	750	645	986	1,878.72
Wisconsin	15	767.03	1,253	8	12	42	310	1,471.92
Southern States								
Alamaba	10	329.53	459	2	3	61	10	24.24
Arkansas	7	119.23	243	:::	2	17	20	20.60
Florida	7	209.82	384	:::	4	24	90	67.15
Georgia	7	370.42	556	2	18	44	69	45.39
Louisiana	8	285.65	834	:::	2	78	61	72.70
Mississippi	7	24.00	35	...	...	3	56	35.20
North Carolina	8	321.97	215	17	163	40	60	39.02
South Carolina	4	60.16	72	...	3	9	9	32.70
Tennessee	9	455.01	646	3	3	71	49	366.04
Western States								
Arizona	3	24.46	33	...	3	3	13	22.98
California	26	3,464.55	4,322	102	3,020	428	592	1,410.41
Colorado	9	342.70	393	9	222	86	46	69.70
Idaho	1	......	...	...	...	...	11	17.00
Kansas	15	431.47	291	14	95	38	121	166.69
Montana	8	705.15	119	50	1,465	32	5	3.50
Nebraska	4	183.88	472	3	2	67	54	42.49
North Dakota	3	25.54	43	...	...	9	4	4.95
Oklahoma	11	378.84	258	19	150	34	140	177.79
Oregon	5	684.73	685	24	485	116	62	71.40
South Dakota	1	......	...	...	...	...	27	574.23
Texas	22	1,025.84	1,360	5	5	142	295	399.83
Utah	7	472.45	320	14	348	58	27	78.94
Washington	18	1,293.08	1,000	47	231	69	135	279.71
Wyoming	1	......	...	...	...	...	9	28.50
U. S. Total	671	42,431.40	73,768	945	13,170	8,724	11,854	23,885.70
U. S. Possessions	5	125.39	268	1	29	25	98	67.73
Canada	57	2,505.86	4,199	65	713	449	499	983.7
Grand Total	733*	45,062.65	78,235	1,011	13,912	9,198	12,451	24,937.3

*Includes 55 companies which now operate only buses.

THE MERCHANT MARINE

BY PETER BAIN
EDITOR, *American Shipping*

GENERAL STATUS OF AMERICAN SHIPPING

American ships and shipping seem at length to be on the way toward restoration to a ranking position. American shipping in the past has not been recognized as a factor contributing to national development and well-being. This has been abundantly evident from the omission of all reference to it in the reports and forecasts of banks, economists, manufacturers, agriculturalists, and industrialists generally. Ships and shipping did not participate in our recent business prosperity; therefore, they experienced and suffered less of the shock and disruption of activity that other industries felt when that prosperity came to an abrupt end in 1929. So far as our otherwise domestic needs are concerned, we are overbuilt, over-equipped and overproduced, hence the business slump through which we are now passing. More or less half-heartedly we have sought to develop foreign trade, but have essayed the task without the necessary and proper tools and equipment,—ships, American built, owned and manned, and suported by American bankers, agriculturalists, manufacturers, exporters, importers, and our citizens generally. American shipbuilding and American shipping are unique to the extent that they are practically our only industries not over-expanded, over-equipped, nor classified meantime as over-producers. The stock market crash, with its exposure of a substantial recession in business generally, has helped to emphasize just these important facts. Interest and attention, therefore, are now focussed on the industries of shipping and shipbuilding in manner and anticipation as at no time since the clipper ship days. The experience is a new one for most of us.

FOREIGN TRADE CARRIAGE

Expansion Problems.—During 1930, for the first time since the war, the American Merchant Marine made substantial progress towards its objective of transporting overseas from 50 to 60 per cent of our foreign trade, as against a hitherto 25 to 30 per cent. Indicative of that progress, agreements relating to the construction of no fewer than 68 ships aggregating about 700,000 gross tons and costing about $275,000,000, for the most part for overseas service, had been signed before the second half year had scarce begun, and, in succeeding months, this development tended to increase rather than diminish in number, tonnage and value of ships involved. Thus, with our shipping industry facing probably the greatest expansion in its history, it is now being realized as never before that many new problems will arise and demand solution; many fields for research and investigation will open up; many old unsolved problems will have to be squarely faced, and all inefficient operation practices of the past be replaced by modern means and methods scientifically applied. Personnel must receive equal attention with ships and their physical equipment.

Urgency of Cargo Carrier Replacement.—One of the most gratifying features of the 1930 expansion of the merchant marine was that all uncertainty as to its being and well-being has been dispelled. It no longer remains a problem to be solved; it is at length hard fact. Our people have come to recognize it as a national economic need as well as a national defense asset. Yet, although on our way, so to speak, we must travel far before we can even catch up with the transportation equipment of not a few competitor nations also in world trade and still sharing to a highly disproportionate degree much of our own. Transportation equipment embraces both passengers and freight in its detail make-up. Thus, while indications are not lacking that within the next three or four years we probably will occupy pride of place as far as a fleet of speedy express and passenger liners is concerned, no real effort has yet been made to replace our obsolescent and out-moded cargo carriers built during the war and under war pressure. The backbone of any merchant marine centers in its cargo vessels. Action is now being taken whereby replacement of the war-time built cargo fleet may be stimulated through the granting of low interest-bearing Government loans and substantial mail subsidies to aid service operation. Cargo vessels may not claim consideration as mail carriers, still that is no reason why some other and equally substantial and stimulating form of aid should be withheld. There is such a thing as a well-balanced merchant marine and we are seeking to achieve it. Until, however, a program of Government aid is formulated and enacted, maintenance of our out-of-date cargo vessels instead of their replacement can not do otherwise than make our merchant marine effort ill-balanced and, therefore, correspondingly and competitively inefficient.

Foreign Trade Comparisons.—Foreign trade carried in American ships during the decade prior to 1914 averaged $300,000,000 annually. This compares with the past decade when it averaged $2,600,000,000. In 1914, six American Flag ships of 70,000 gross tons were operated in our foreign trade with Europe. Today, there are 232 ships of 1,500,000 gross tons operating in this trade. In 1914, there were five American Flag ships of 23,000 tons operating in the trade between the United States and South America. Today, we have 90 ships of 550,000 tons operating in this trade. In 1914, we had no American Flag ship to the African continent. Today, we have 22 ships of 125,000 gross tons. In 1914, there were five American Flag ships operating from Pacific Coast terminals to the Far East. Today, we have 140 ships of 1,000,000 gross tons operating in trade with Asia. Comparing the 1910-1914 period with that of today, our trade with Europe has increased 50 per cent; with South America 200 per cent; with Africa 325 per cent; and with Asia 380 per cent. In our established services in the foreign and non-contiguous trades there are now employed nearly 700 vessels of almost 4,000,000 gross tons and nearly all of these vessels are of 2,000 gross tons and over. All important trade routes from the United States are now being served with American owned and operated ships. Twenty-five private companies now operate 79 lines, 44 from the Atlantic seaboard, 14 from the Gulf, and 21 from the Pacific coast. The amount of tonnage under construction on July 1, 1930, increased 187 per cent over that on July 1, 1929.

DOCUMENTED AMERICAN SHIPPING

Ownership. — Documented merchant shipping of the United States as of Nov. 1, 1930, was represented by 2,347 vessels of 10,300,697 gross tons. Of this, and of 1,000 gross tons and over, the Shipping Board was credited with 436 steel vessels of 2,437,502 gross tons. In addition, the Shipping Board owned several vessels (tug boats), of between 500 and 1,000 individual gross tonnages. Private ownership was credited with 1,911 vessels of $7,863,195 gross tons, made up of 1,455 of steel of 7,286,934 gross tons and 456 of wood of 576,261 gross tons.

Classification.—On the same date vessels of 1,000 gross tons and over inspected for passenger service numbered 198 of 1,348,731 gross tons. Passenger capacities, cabin and other, totalled 72,610 persons. Age of the vessels ranged all the way back to the year 1870, and their speed in knots from 5½ to 24. Not the least impressive section of our now great merchant fleet is that employed exclusively in the transportation of petroleum in bulk. On Nov. 1, 1930, the unit constituent was represented by 412 steam and motor vessels of 2,400,615 gross tons and 1,145,332,000 gallons tankage; 37 sailing vessels of 67,915 gross tons and 37,085,000 gallons tankage; and 76 unrigged vessels of 62,729 gross tons and 36,889,000 gallons tankage; in all, 525 vessels of 2,531,259 gross tons and 1,219,306,000 gallons tankage. Refrigeration equipped vessels on the same date numbered 14, of 75,118 gross tons and 3,878,998 cub. ft. of insulated cargo space.

Value.—The value of all ships owned and controlled by the United States Shipping Board Merchant Fleet Corporation was, toward the year end, approximately $74,000,000, distributed over 452 units as follows: cargo carriers, 429; passenger liners, 2; refrigeration equipped, 10; submarine, 1; tanker, 1; and tugs, 9. The submarine is that which Sir Hubert Wilkins will use in an expedition to the North Pole. Since the Merchant Marine Act of 1920, altogether 1,569 vessels have been sold on a cash or instalment basis for $123,823,573. Of the number 552 were cargo carriers, 92 tankers, 4 refrigeration-equipped, 43 passenger craft, 41 tugs, 259 miscellaneous and 578 were scrapped. That the indicated values combined are but a fraction of the original cost goes without saying.

SHIPPING BOARD ACTIVITIES

Law Amendment Recommendations.—Readjustment of American shipping laws to meet conditions confronting the American Merchant Marine was strongly urged by the United States Shipping Board in its 14th. annual report. It recommended that the rates of mail compensation authorized under the Jones-White Act be revised to provide higher pay for vessels in excess of 24 knots speed, and that the principles embodied in the so-called White Clarification Amendment, which provided for the award of mail contracts to purchasers of Shipping Board lines, be enacted into law.

Loans.—At the close of the fiscal year, June 30, 1930, the Board had authorized loans to 22 steamship companies for the construction of 49 vessels and for the conversion or improvement of 13 others. The loans totaled $114,564,715, of which $43,050,890 was advanced before June 30. Since that date, the total amount of loans authorized has been increased to $131,793,003.25.

Tonnage Ownership.—Continued sale of Government lines and individual ships has brought appreciably nearer the time when all merchant tonnage flying the Stars and Stripes will be owned and operated by private American interests. Already a preponderance of American tonnage is in private hands, the records showing that of the 1,797 American ships of 1,000 gross tons or over, registered on June 30, 1930, a total of 1,329 ships, aggregating 6,997,000 gross tons, was privately owned, while 466, aggregating 2,660,000 gross tons, were still in the hands of the Government. These figures show that at the close of the fiscal year 74 per cent of the ships and 72 per cent of the tonnage were owned by private American interests.

Disposal of Ships by the Board.—Of the number of ships remaining in the possession of the Shipping Board, only 184 are in active operation, and the question of disposing of the others, by sale, scrapping, or otherwise, is constantly before the Board. Although the Jones-White Act, with its construction loans and mail-pay provisions, has tended strongly to accelerate the sale of the Board's remaining lines to private American interests, sales have recently lagged pending further clarification and interpretation of the law. During the fiscal year, a total of 100 ships was sold for approximately $4,269,718. The sales comprised 97 cargo ships, 1 tanker, 1 tug, and 1 launch. Of the number, 43 were sold for scrapping.

Employment.—Through the activities of its Sea Service Bureau the Shipping Board reports a substantial percentage of American citizens given employment on American vessels. The total number was 65,606, of which 89.6 per cent were American citizens. This may be compared with conditions existing in 1914 when less than 15 per cent of the men employed on American ships were citizens.

LINER CONSTRUCTION

Super-Liner Project.—On Feb. 12, the United States Lines submitted to the Shipping Board plans and specifications for two transatlantic express ships. Tentative details given out indicated that each would be 962 ft. long; of 107.5 ft. beam, in excess of 50,000 gross tons, and capable of maintaining a sea speed of 28.5 knots. Little progress was made during the year towards starting construction of either for, aside from lack of Shipping Board and Navy Department approval of the plans and specifications, start of construction is known to hinge upon the value of mail contracts being sufficiently attractive. Estimated cost of the two ships is $60,000,000 towards which a construction loan of $45,000,000 is sought. The United States Lines is under contract with the Shipping Board and the Post Office Department to build these ships, yet it is meantime questionable whether mail contracts already determined will allow profitable operation. Along with the *Leviathan*, the two express liners are planned to maintain a service second to none between New York and the Channel ports of Cherbourg, France, and Southampton, England. Incidentally, this means not only a super-service of creature comfort and luxuriousness but one also that is expected to earn for the United States the distinction of owning and operating two vessels either of which, relative to all competitors, will be a speed queen in its own right.

Passenger Liner Accomplishment.—Prominent among the year's achievements that gave practical expression to the fast passenger-liner phase of our merchant marine were the following: keel-laying with due ceremonial on Dec. 6 at Camden, N. J., of the first of two 30,000-ton vessels for the transatlantic service of the United States Lines. They will be 705 ft. long and 86 ft. beam. Their sea speed will be 20 knots and passenger capacity will be about 1,300, distributed through first, tourist and third class accommodations. Keel for the second will be laid early in March, 1931. Deliveries ready for service are scheduled for July and November, 1932, respectively. Launching of the *President Hoover* at Newport News, Dec. 9, marked the entry into its native element of the first of two epoch-marking ships being built to the order of the Dollar Steamship Lines, internationally known for its "President" fleets plying between United States ports and the Orient, and in Around-the-World service. The *President Hoover* is to be turned over completed to its owners, June 1, 1931, on which date the ship will carry the distinction of being the largest, most modern and palatial merchantman yet constructed in an American shipyard. The *President Hoover* is 653 ft. long over all; of 81 ft. beam molded; 33,800 tons displacement at designed load draft; and 21 knots service speed. The propulsion mediums employed are steam turbine-electric of 26,500 shaft-horse power. Another noteworthy addition to our merchant marine and more than half way towards service entry is that of the four ships being built for the Export Steamship Corporation for its Mediterranean passenger and freight service. Two of three launched during the second half year successfully completed their trials before the year end. They are 475 ft. long, and of 8,700 gross register tonnage. Again, from the Fore River yard of the Bethlehem Shipbuilding Corporation, two Matson liners, the *Monterey* and the *Mariposa* will be delivered in 1932 for service between our North Pacific coast, Australia and South Sea Islands. Each vessel will have a speed of more than 20 knots and will provide accommodation for 800 passengers. Outstanding vessels completed and entered into service during the year included the steam turbine-electrically-propelled Grace liner *Santa Maria*, of 505 ft. length, 16,000 tons displacement and sea speed of 18 knots; the Ward liners, *Morro Castle* and *Oriente*, each of 11,300 gross tons, 508 ft. length, and 20 knots speed; the New York and Porto Rico Steamship Co. liner *Borinquen* of 7,000 gross tons, 429 ft. length over all, and 16 knots speed.

The *Borinquen* enters service about Jan. 1, 1931.

SHIPPING TRAFFIC

Freight Factors.—Notwithstanding the quite abnormal activity displayed in the upbuilding of our merchant marine, the indisputable fact remains, that throughout 1930, freight rates in practically every line of commodity and in all services continued too depressed for the satisfactory and therefore profitable operation of a large section of our cargo-carrying fleets. Other maritime nations were similarly affected, great numbers and tonnage of vessels being decommissioned and laid-up. On Sept. 30, 1930, of 500 gross tons and over, we had 585 vessels of 2,308,811 gross tons listed as laid-up. Of the respective totals, 258 of 1,417,646 gross tons belonged to the Shipping Board and 327 of 891,165 gross tons were of private ownership. These latter consisted of 217 steam or motor propelled craft of 737,254 gross tons and 110 sailing vessels of 153,911 gross tons. No sailing vessels are owned by the Shipping Board.

Passenger Rates and Bookings.—While passenger liner rates were for the most part studiously maintained, as a result of the world-wide commercial and industrial depression, traffic as a whole fell substantially below that of 1929. The position became still further aggravated when bookings for the usual and varied series of winter cruises brought forth but a scant patronage response. Many cruises were, in consequence, cancelled. As the greater number of such projects involved foreign vessels, the inconvenience and loss affected our liner companies but slightly. Profiting by the experience of 1930, all lines in the North Atlantic Conference have arranged to slash rates for the coming 1931 season.

THE AIRSHIP

By Leslie E. Neville

Technical Editor, *Aviation*

GENERAL

Transportation.—In 1930 progress was made by the Department of Commerce in an ambitious program to provide lighted airways with complete radio service. Contract air mail, passenger and express lines are operating regularly and increasing in number. Airline fares have been reduced in many instances to the point where they are equal to railroad fares on a mileage basis but a more recent tendency has been toward increasing fares above the railroad level in an effort to render the transport lines economically practicable. The increase, however, is to be expected considering the importance in time saving effected by air travel. Aside from the transport field, there is a considerable group of privately owned airplanes used for sport and business purposes, as well as an ever-increasing fleet of airplanes used in aerial taxi, touring, photography and miscellaneous services. More than 125,000 miles are being flown daily by 45 mail and passenger operating companies over routes having a combined length of approximately 54,000 miles.

Technical Developments.—Federal and commercial agencies are cooperating in a very completely organized program of technical development of all types of aircraft, engines, accessories and aids to aerial navigation. This is resulting in continually increasing safety and decreasing cost, not only of air transport service but of aircraft engine and accessory production. The lighter-than-air field, from a transport standpoint, remains virtually the same as last year and none of the promises for dirigible lines have been fulfilled. Craft of this type, however, have been undergoing continual development and one of the outstanding accomplishments of the year was a small experimental dirigible built entirely of metal.

Licenses and Permits.—Department of Commerce figures show 13,000 licensed pilots on the active list, a substantial increase over the previous year, and 3,203 student permits, the latter figure showing a considerable decrease. Ten thousand aircraft were licensed for private use. Three hundred and eighty-two airplanes have been approved by the Department of Commerce for production and 61 engines have received similar certificates (Nov. 29, 1930). Increases in these figures have not been as great as in the previous year, indicating a greater standardization of airplane types.

AIRCRAFT TYPES

The Biplane.—For passenger transport and touring, monoplanes are still used more extensively than biplanes. However, two companies continue to manufacture transport biplanes largely because of the obvious advantage of greater wing area and correspondingly low landing speed. Flying boats and amphibions also are being used in increasing numbers because of the popular demand for water craft and also the nearness of waterways to the centers of important cities. The popular three-seater biplane of 90 to 100 horsepower, is rapidly diminishing in point of numbers and apparently is being supplanted by craft of lower and higher seating capacity for more specialized services. Demand for increased performance has made it necessary to employ greater power per passenger than such airplanes provide.

The Monoplane.—For actual transport service, the multi-engine monoplane holds predominant position, while for the industrial executive, private individuals and various similar uses, a single-engined monoplane of the enclosed type has been the most frequently encountered. This type is characterized by its refinements of interior finish which is comparable to present automobiles. These two varieties of monoplanes, particularly the larger group devoted to transport use, are luxurious in their appointments, and provision for passenger comfort is made in every possible way. Accommodations in the transport planes are comparable to those of railroad trains and, where their use demands, have sleeping accommodations. There is a definite tendency toward increased seating capacity and many of the larger transport planes accommodate more than thirty passengers and their baggage.

Light Planes.—Considering the lower end of the scale, there has been a very definite increase in numbers of light, single-seater airplanes among the new designs of 1930. These machines have been introduced to satisfy the demand for relatively inexpensive craft for private or sport use and are empowered with engines below 50 horsepower and often of the two-cylinder, two-stroke cycle type. Plans of manufacturers indicate that there will be an appreciable market for these machines in 1931.

AIRCRAFT SPEED

Commercial aircraft speeds are being increased along with other performance factors and average cruising speed is probably more than 100 miles per hour with the present-day equipment. In certain cases, much greater speeds can be attained in smaller high performance airplanes of highly refined design and the highest speed yet obtained by any craft is that of the recent Schneider cup racer of 357.7 miles per hour. The recent tendency in commercial design, however, has been to increase speeds by aerodynamic refinement rather than increasing the horsepower available. Continuous but gradual advances are being made in increasing the proportion of the gross weight of a plane that may be applied to useful load carrying.

AERODYNAMICS

Extensive studies are being made of the fundamental problems in this branch of aeronautical engineering. Stability, controllability and spinning characteristics are being investigated in great detail both in the wind tunnel and in actual flight tests by the

National Advisory Committee for Aeronautics and other agencies. A considerable increase in knowledge of airplane performance characteristics and other fundamental aerodynamic problems was gained as a result of the recent Guggenheim Safe Aircraft Competition. One of the interesting outgrowths of this competition was the development of the floating aileron by the Curtiss company. The contest also afforded the possibility of the study of the effect of wing flaps and other variable lift devices in connection with airplanes. Propellers with pitch variable in flight are also being considered and one or two promising ones have recently appeared on the horizon.

MACHINE PROGRESS

Materials.—Use of metal is gradually gaining over wood in the structures of a majority of airplanes, yet wood continues to be the predominating material for use in a wing construction. Fabric covering is still used extensively although in a few cases sheet metal covering is employed. There are several airplanes on the market that are built entirely of metal. In the fabrication of airplanes, welding is used universally for steel and riveting for aluminum alloy.

Accessories.—Mechanical and hydraulic brakes are being used increasingly on virtually all types of airplanes except those used primarily for training purposes and the recent introduction of low-pressure airplane tires has made it possible to eliminate the use of landing gear shock absorbers in many cases. Rapid developments are being made in the field of aircraft radio equipment and the radio beacon has been developed to the point where it is an invaluable asset in "blind flying" and general air navigation.

Instrument Research.—Refinements of airplane instruments are constantly progressing, and electricity is playing an increasingly important part in the development of many new aircraft instruments. Considerable attention has been given to the arrangement and condensation of instrument boards in order to enable the pilot to be apprised of operating conditions at a port by simply glancing at the instrument board. With this idea in mind, the indicating units and dials of aircraft instruments have been very highly developed. In some centers research work is progressing in the problems of blind flying and the automatic pilot, although the latter device has not yet been utilized in general commercial use.

Air-Cooled Engines.—By far the majority of commercial airplanes are equipped with air-cooled engines. The output of these engines is continually increasing and those in the higher ranges are being used increasingly in military services. Planes powered with 200-300-horsepower engines seem to be the most general in use. Probably the outstanding accomplishment of the year has been the successful production of a radial engine operating on the Diesel cycle. This engine has been tried in a number of aircraft, and it is probable that more of this general type will follow. A number of excellent power plants have been developed in the output range of approximately 100 horsepower in an effort to replace the war surplus engine used so extensively in the early stages of the industry. In the lower horsepower range there has been also a very marked tendency toward the use of engines with cylinders in line rather than radially disposed. A number of these developments have been engines of the inverted type which have obvious advantages from the standpoint of increasing pilot visibility. The development of high temperature liquid cooling of power plants normally water-cooled has revived the interest of many engineers from the possibility of liquid-cooled engines. In order to provide a power plant for the light single-seaters which have become popular during the past year, it has been necessary for engine designers to look in the direction of the two-stroke-cycle type of engine. Several of these engines are on the market, the usual form being two-cylinder opposed and developing in the neighborhood of 40 to 50 horsepower. There are also a number of additional designs of this type in the process of development at the present time.

Radiators and Propellers.—The problem of radiator location for liquid-cooled engines is still an important one but the use of chemical cooling makes possible a considerable decrease in radiator area, resulting in reduction of heavy resistance. Wing radiators, in their present form, continue to be too expensive for use in commercial airplanes. Aluminum alloy propellers with adjustable blades are by far the predominating type but experiments are now under way and tests being made at Wright Field on a hollow steel propeller show considerable promise. In this connection, the idea has been advanced that by suitable incisions in the blade and a specially designed hub, the propeller might be used as an exhaust silencer for the engine, by passing the exhaust gases through the blades.

FLIGHT FACILITIES

Lighting.—At present there are some 14,000 miles of airways fully equipped for night flying and a substantial portion of them has complete radio equipment and comprehensive weather reporting service.

Weather Service. — Transcontinental radio weather service is provided and radio telephone reports are broadcast at intervals, providing aviators with local conditions for the various areas. There are more than 206 weather stations, as well as a large number of auxiliary weather bureau and Department of Commerce Airway Stations and approximately two score upper airway offices. These stations are all inter-connected by radio, telephone and telegraph and in addition to these a number of privately operated stations have been installed by airlines to provide two-way communication between the station and their planes.

Radio Beacons.—One of the most important aids to aerial navigation is the radio beacon, a number of which have been installed and are in service and many more to be provided. A twelve-course radio beacon has been developed by the Bureau of Standards and soon will be placed in operation.

Air Routes.—As previously mentioned, more than 54,014 miles of air route were being operated by 45 mail and passenger operators covering 120,358 miles daily (Sept. 1, 1930). The number of air-mail contractors will be considerably influenced by new legislation, known as the Watres Bill which provides an entirely different premise for payment for the movement of mail by private contractors. In general it places mail on passenger lines and has a definite tendency to eliminate the exclusive air-mail line and convert it into a passenger line as well as to place it on existing passenger lines. This bill should develop the air-mail service, as well as the air passenger lines.

Airports.—At present there are 1,600 airports of record. More than 1,066 cities have established airports while there are 80 Federal fields in existence at the present time. These ports are in addition to those of the Army and Navy and Department of Commerce, and nearly 800 additional ones were proposed during the past year.

Hazards.—The hazards of flying is continually being reduced in aircraft operation, both military and commercial. Careful attention to the design of fuel systems and a decided effort to keep gasoline lines away from all sources of naked flame are contributing factors in this advance. An increased safety record is shown for the established transport lines and safety in flying scheduled routes is recognized by an increasing number of life insurance companies, many of whom have eliminated exception clauses in their policies. Air risks of all sorts may now be covered by insurance.

Air Marking.—Following considerable research as to the most desirable form of airway markers, a large number of the more important cities and towns have provided such guides to aviators. Corporations have marked and lighted their plants and in other instances have followed suit, and a number of communities have provided airway markers through enterprising civic organizations. Provision has also been made to place adequate obstruction lights on towers and other menaces to aerial navigation.

GOVERNMENT AIR AGENCIES

Post Office Department.—The first air-mail service in the United States was inaugurated by the Post Office Department which until Sept. 1, operated the Transcontinental Air Mail. At that time, both sections of this route were turned over to private contractors and all such routes at the present time are conducted by private contractors through the Post Office Department. (For military and naval aeronautics see Division IX.)

Mapping.—A program of 52 airway maps is now under way and has nearly been completed by the Department of Commerce. Thousands of square miles of territory were photographed during the year by the Army and Navy for other purposes.

The National Advisory Committee for Aeronautics, composed of 15 members appointed by the President from governmental departments in civil life, is charged with the duty of the sub-division and direction of the scientific study of the problems of flight with a view to their practical solution and the determination of problems worthy of experimental attention and the presentation of the results of both experimental and scientific work for the advancement of and practical application to the development of aeronautics. This organization has headquarters in Washington and a completely equipped research laboratory at Langley Field, Va., and it functions through the executive committee and various standing technical committees. Not only does this organization engage in research work in its own laboratories, but also provides for the allocation of research on particular problems by various other governmental and private institutions. Its publication section broadcasts the results not only of its own research but also of interesting technical developments throughout the world.

Department of State.—Aeronautical reports of the diplomatic and consular services are made available to the industry and during 1929, arrangements were made for air touring in various countries. The Bureau of Foreign and Domestic Commerce maintains commercial attaches and trade commissioners in all important countries. Reports are made available to the public; opportunities for the sale of American aeronautical equipment abroad are brought to the attention of American firms through this agency.

Bureau of Standards.—From the beginning of flying, this Bureau has made an important contribution to the existing technical knowledge of the industry. One of the most important phases of this branch of the service is the study of aircraft instruments and verification of accuracy. This applies not only to commercial types of instruments but to those used for measuring the performance characteristics of airplanes engaged in record flights. As previously mentioned, it has made important contributions to the important development of the radio beacon and other air navigation devices. Other important work of this agency include a study of the existing methods of sound-proofing airplane cabins and a number of structural investigations.

The Patent Office has the obvious function of handling aeronautic patents and many thousands of these are granted annually.

The Bureau of Mines has made extensive use of airplanes in carrying rescuers and machinery to mine disasters and for surveys and maps. It is also well known for its work in helium research and its plant at Fort Worth, Tex., produces the helium required and used in the military air services.

The Bureau of Census is concerned with a specific variety of statistics and, in its biennial Census of Manufacturers, it includes aircraft engines and accessories.

The Bureau of Lighthouses, under the Air Commerce Act, is also engaged in installation and maintenance of light beacons and intermediate fields as well as other aids to air navigation such as the radio beacon, radio telegraph and radio telephone along the airways.

The Coast and Geodetic Survey.—Since 1920 this organization has employed aerial photographs in its normal work and is also charged with air mapping.

Department of Labor.—Under the Air Commerce Act the Secretary of Labor designates ports of entry for air immigrant aliens, details men and applies the general immigration laws to air travelers.

Department of Agriculture.—Aircraft of both the lighter and heavier-than-air types already have been employed by this department to possibly a greater extent than in any other purely civil branch of the Government except the post office, in crop-dusting and estimating, fire patrols, seeding, and other work. The Bureau of Agricultural Economics has done crop reporting by airplane observation and aerial photography and experiments which have successfully demonstrated the airplane's efficacy. The Bureau of Public Roads. Increasing use of airplanes is being made by this agency in the making of mosaics and highways and this is an exceedingly important application.

The Weather Bureau has a specific responsibility in the matter of furnishing weather information to civil airways. New upper air stations have been established at airports or in their vicinity, and a system of distribution was put into effect on the airways in the latter part of 1926.

The Forest Service has been utilizing airplanes for fire patrol duty annually since 1919. A great mass of valuable information for the aeronautical engineer has been accumulated by the Forest Products Laboratory, its aeronautical research being confined of course to wooden structures and methods of fabrication employing this material.

The Bureau of Entomology has conducted extensive war by air against the wheat rust, the boll weevil, locusts and other pests.

The Geological Survey has used airplanes extensively in the production of new maps and the correction of old.

The Treasury Department, under the Air Commerce Act, designates port of entry for aircraft, details customs men, and applies the laws relating to customs and public health. Prohibition enforcement by airplane has been attempted by the Department of Internal Revenue.

The Public Health Service deals with the quarantine regulations, the water supply on aircraft and other common carriers, and other factors contributing to the general health of the public. It also conducts medical examinations of air immigrants.

The Coast Guard.—For the past six years an air service has been in existence for the purpose of furthering the work of this organization, the function of which is to render assistance to vessels or aircraft in distress, give medical aid to deep sea fisheries, and protect custom revenues and enforce laws and regulations governing anchorage of vessels in navigable waters.

Smithsonian Institution.—Among other things, this agency has the custody of aeronautical materials representing the progress of the art. For more than 60 years it has been active in aeronautics. It encouraged three early attempts to cross the Atlantic by air and its officers were largely responsible for the use of the balloons in the Civil War and for the experiments of Langley.

The Board of Surveys and Maps, correlates and coordinates the map and chart making and using agencies of the Government and provides contact with states, counties, cities and the public. The board is composed of representatives from all governmental agencies interested in maps.

The Federal Power Commission is interested in all matters pertaining to the utilization of natural resources for the making and transmitting of power and in many of these surveys the airplane plays an important part.

Patent and Design Board.—This board was created by the Army Aircraft Bill of 1926, and consists of the three assistant secretaries for air.

Any individual, firm or corporation may submit a design for aircraft, aircraft parts, or aeronautical accessories which are patentable or unpatentable, to the board. After favorable recommendation from the National Advisory Committee for Aeronautics, it can determine whether the use of such a design for the Government is desirable and necessary and fix value to the owner for rights.

Committee on Aircraft and Fog Flying Research.—A preliminary report has been issued by an official committee organized by the Daniel Guggenheim Fund for the Promotion of Aeronautics to study the problem of fog-flying. This committee also comprises representatives of the Department of Commerce, Bureau of Standards, Bureau of Aeronautics and the Navy Department, the Post Office, and the Army Air Corps. Other subjects including radio beacons, capacity altimeter, field localizers, acoustic altimeter, and lighting are among those being considered.

THE RADIO

By W. R. G. Baker

Vice President, RCA Victor Company, Inc.

GENERAL PROGRESS

Technical.—The year 1929 established new records for advances in sales and technique, extending the field of radio and radio by-products. Additional data were obtained on the behavior of the shorter waves under a variety of conditions, and further attempts were made to investigate and explain the "blind spots" or "dead areas" which have so long mystified radio engineers.

International Programs.—International relations have no doubt been improved by the interchange of programs which were broadcast in many different countries. Such hook-ups make it possible for one individual to address the whole civilized world on topics of international interest. Last year presidential candidates discussed their platforms with all America for an audience; next year (1930) at the London Naval Conference, King George will address the world, inviting everyone to hear the proceedings. The true value of radio as an aid to world peace and international coöperation is hard to estimate. Certainly radio (and its "nephew," the talking picture) will foster and perhaps determine a world-language. Progress of this sort is at least as important as technical advancement.

High Frequency Therapy.—Another new radio development, which may revolutionize medical practice, is high frequency therapy. It was demonstrated at Schenectady that the field immediately surrounding a tube oscillator of extremely high frequency produces a marked heating effect in animal tissue, resembling fever, and that this artificial fever destroys certain types of disease germs. Details of the experiments were broadcast, and no doubt the medical schools will investigate the utilization of these phenomena.

Communication.—Along communication lines, an outstanding item concerns the Byrd Expedition. For the first time in history, an explorer in one of the spots on earth most remote from civilization has been in constant touch with events through stations all over the world, and has been entertained by regular broadcast programs. Telephone communication via radio is now possible from a moving train, airplane, or steamship, and the range of such service is being expanded rapidly. Most of these developments demonstrate man's triumphs over distance in reducing the effective size of our planets. The limit is in sight, from the viewpoint of communication, and the engineers will soon be, like Alexander, literally "looking for new worlds to conquer."

RADIO MANUFACTURE AND SALES

Volume and Types.—Manufacturing continued during 1929 to increase in volume in spite of financial disturbances during the last quarter. The demand was almost exclusively for "all-a-c" (alternating current) sets with built-in dynamic cone loudspeakers. The console-type cabinet was featured by most manufacturers, and at lower average prices. The screen-grid or "four-element" tube receiver was introduced during the year, and attained popularity.

Retail Sales.—According to a survey made by *Radio Retailing*, the total retail sales of radio for 1929 exceeded 1928 by 22 per cent. Many items, however, fell far below 1928 levels. The outstanding decrease was in the sale of separate loudspeakers, which amounted to only one-fourth the 1928 total value. The movement of surplus stocks of old type magnetic speakers probably accounts for the lower average price per unit. Sales of dry batteries decreased nearly 40 per cent while storage batteries, chargers, and separate power units lost 18 per cent. The sale of parts to the public continued to decrease, standing 38 per cent below 1928. These losses were more than offset by increases in the major items. Radio-phonograph combinations head the list with an increase of 193 per cent in the number of units and 77 per cent in dollars. Tubes gained 38 per cent in units, and 56 per cent in value. Receivers gained 65 per cent in units and 34 per cent in value. "Other accessories" increased 20 per cent.

Prices.—It is significant that average unit prices on radio-phonograph combinations dropped from $468.00 (1928) to $282.00 (1929), while the price of the average receiver decreased from $154.00 to $125.00 in spite of the larger proportion of console cabinets and built-in dynamic speakers. The average tube sold for $2.50 in 1929 compared to $2.20 in 1928. The increasing use of heater-type a-c tubes and the obsolescence of battery sets which had utilized the cheaper 201-A type of tube probably account for the difference.

1929 RADIO SALES AT RETAIL

(From survey of *Radio Retailing*)

	Units	*% of 1928*	*Dollars*	*% of 1928*
Receiving Sets (Incl. Consoles and Built-in Speakers)	4,200,000	165%	$525,000,000	134%
Radio-Phono Combinations	238,000	293%	67,068,000	177%
Tubes, All Types	69,000,000	138%	172,500,000	156%
Reproducers	800,000	33%	16,000,000	24%
Dry Batteries	....	....	30,530,000	61%
Storage Batteries, Chargers and Power Units	....	....	14,350,000	82%
Other Accessories	....	....	9,600,000	120%
Parts (direct to public)	....	....	7,500,000	62%
Total for 1929			$842,548,000	122%

BROADCASTING

Receivers.—Improvements included increased fidelity, sensitivity, and selectivity, all approaching fairly closely the theoretical and practical limits. Since the maximum of any characteristic is in general not suitable for all conditions, there is a tendency to provide individual adjustments on one or more of these characteristics as well as an automatic volume control to compensate for "fading" signals. The "four-element" or screen-grid tube was accepted by engineers as an antidote for neutralization troubles in the design of a receiver and the high gain per stage made possible by this tube, together with a growing tendency toward use of but one audio stage (with a "high-power detector" circuit) has reduced the average number of tubes needed per set. Nearly 90 per cent of the receivers sold were of the console type, with built-in speakers, usually of the dynamic variety.

Automobile Radio equipment is now standard on several expensive cars and is available for installation on most well-known makes. Magnetic speakers are used with such installations and with farm receivers, which together constitute about the only demand for speakers of this type. In several cities the police are using radio-equipped automobiles for bandit-patrols, with considerable success.

Short Wave Channels supplemented the usual broadcasting equipment, carrying regular programs to the Byrd Antarctic Expedition and to remote sections of the world.

Centralized Radio receiving equipment is now built-in for hotel and apartment use, distributing programs at either radio (incoming signal) frequency or audio (detected tone) frequency. Phonograph music is often provided as an alternative.

Aircraft Radio.—In addition to an increased number of radio beacon lanes for the guidance of aircraft, an hourly weather bulletin is now broadcast giving flying and landing conditions at various airports. These facilities, together with the Radio Altimeter (height indicator) have made possible "blind" flying through fog (and even landing) guided by instruments alone. An "automatic-pilot" has been demonstrated, that will relieve the operator of most of his duties while in flight. Radio has also been used to control landing lights at emergency fields, etc.

RADIO BY-PRODUCTS

The Talking Picture grew, during 1929, from a novelty to an accepted means of entertainment and education. Drastic changes have been made at the studios to meet the requirements of sound recording. Portable studios, in motor trucks, have been produced for news-reel work. High-quality recorders and reproducers have been developed. Portable projecting equipment is also available for advertising and home use. The improvement of theatre acoustics is now one of the major problems, as each case requires an individual solution.

Musical Instruments of several types are based upon radio developments. The electric phonograph, among the earliest of these, now appears almost exclusively in combination with a radio receiver, an economical arrangement because many component parts are common to both. Combination instruments were included in the lines of many manufacturers in 1929 and sales were nearly three times those of the previous year. A more recent instrument, the "Theremin," improves on the traditional stockyard's efficiency by utilizing the "squeal." It is essentially a beat-note oscillator, arranged for control by variation of hand-capacity. Its manipulation, by the mere waving of hands, without touching the instrument, is somewhat spectacular. Tone-quality resembles that of a violin. The possibilities of this type instrument have hardly been touched.

Film Recording of Sound.—Another by-product, the film-recording of sound, recently made possible the broadcasting in the United States of a complete program originating in widely separate countries of Europe. The selections were recorded on film individually, with appropriate introductions by the announcer, then assembled for a continuous reproduction lasting an hour or more. An adaptation of this arrangement, called the "Talking Book" is of considerable interest, particularly to the blind.

Other By-Products of radio include the hundreds of applications involving the vacuum tube, the photo-electric cell and the gas tube, for the control of industrial processes and the conversion and regulation of electric power. Outstanding examples are the color-matching of dyes and fabrics, oven control in baking bread and toasting breakfast foods, smoke control in vehicular tunnels, protective or pilot systems for power networks, etc.

TRANSOCEANIC RADIO

Extension of Service.—Further extensions of both telephone and telegraph service were made during 1929. A new short wave station at Lawrenceville, N. J., opened up direct service with Buenos Aires, provided a third channel for transoceanic telephony, and linked the entire American telephone system with South America. Radiophone service from New York to Australia by way of London (and a new British short wave channel) was demonstrated, and experiments were successful in linking Buenos Aires directly with Paris and Nauen, Germany. New telegraph channels were opened linking New York with Costa Rica, with Peru, and with Syria.

TRANSCONTINENTAL AND MARINE RADIO

The first commercial short wave service was inaugurated by RCA between New York and San Francisco, using a beam projector, equipped for facsimile transmission as well as code messages. The Mackay Radio & Telegraph Co. opened a radio channel connecting maritime service on the Atlantic with several cities on the Pacific coast, Honolulu, and ships on the Pacific Ocean. Telephone service with any Bell telephone in the United States, is now offered by the steamship *Leviathan* while it is within 2600 miles of New York. The British Post Office offers similar service with the *Majestic* and the *Berengaria*.

TRANSMITTERS

Regular international programs were inaugurated, broadcasting to the world announcements and music originating from several countries in turn. Weekly programs from New York were broadcast to the Byrd Expedition in Little America. Further advances were made toward higher power. Station WGY, in Schenectady, N. Y., was operated experimentally at 200 kilowatts after midnight, for several weeks, and many stations are now using 50 kw. regularly.

VISUAL BROADCASTING

Facsimile. — In general, visual broadcasting covers "the reproduction of an image at a distance." Since the image may be either "still" or moving, two different problems are presented. The general term "facsimile" is broad enough to cover either, but its radio application is now understood to mean the more or less permanent reproduction of written (or printed) documents and photographs.

Application of Television.—Television, meaning literally "distant-vision," could also cover both problems, but is generally accepted to mean only the transient reproduction of moving images, either by scanning the scene directly, or by scanning a motion picture film of the scene. One essential difference between the two problems is the element of time required to produce a complete image. For Facsimile there is no limit to the time available per image, and several minutes are the minimum usually required. To maintain the illusion of emotion, however, Television must reproduce many complete images per second.

Commercial Use.—During 1929 facsimile was put to commercial use on a transcontinental shortwave channel, and may soon make possible a "Radio-newspaper" service broadcast complete with illustrations, advertising, comic strips, etc.

Entertainment. — Television programs have been broadcast regularly by several stations, and are attaining a quality which may make them suitable for home entertainment on a national scale within the next few years. The tendency is toward more picture detail, and toward the development of the cathode ray, the Karolus cell, and other improved types of reproducers, as well as toward improved mechanical reproducing methods.

GOVERNMENT REGULATIONS

The life of the Federal Radio Commission was again extended by Congress. The reallocating of channels to reduce interchannel interference, and dividing of time between stations using the same channel (which started late in 1928) was continued in 1929. Temporary licenses were issued to many stations, and others ordered to discontinue broadcasting. While there is evidence of dissatisfaction in some quarters, the operation of fewer stations, with higher power and cleared channels has no doubt improved reception in almost all parts of the country.

RADIO AMATEURS

Coöperation. — Closer coöperation between the amateurs and the Army Signal Corps has been arranged, and provision made for emergency use of amateur facilities. Weekly practice has been inaugurated to improve efficiency in handling emergency traffic.

Foreign Government Regulation.—Although the International Committee on Radio Communication at The Hague convention recommended against the restriction of amateur activities, the year 1929 saw a considerable amount of government regulation in foreign countries. In Russia, the government is coöperating with 500 licensed amateurs and using their facilities for certain observations.

Service.—At the Cleveland Airport, the amateurs of that district handled all communications during National Air Race Week, using their own instruments. In other districts emergency service has been rendered, after floods and storms had destroyed other means of communication, adding new chapters to the amateurs' long record of service.

STABILIZATION OF RADIO INDUSTRY

Engineering and Manufacturing.—A number of unifications and alliances among the larger corporations indicated further stabilization of the industry. One of these combined the Radio engineering and manufacturing facilities of the General Electric Co. and the Westinghouse Electric & Manufacturing Co. with the engineering and sales of the Radio Corporation of America, at the manufacturing plant of the Victor Talking Machine Co. The new organization, known as the RCA Victor Company, Inc., will manufacture and market radio equipment and apparatus for associated fields. A similar organization, RCA Radiotron Co., Inc., combined the radio tube activities of the General Electric and Westinghouse Companies.

Motion Pictures.—Another important change is the combination of the Brunswick Phonograph Co. with Warner Brothers, again linking radio with the motion picture industry. The Radio-Keith-Orpheum Corporation includes even vaudeville, and through other associates in the Radio Corporation of America Group, brings together entertainers of stage, screen, phonograph, and broadcast fame.

Automotive Combination.—Radio is also linked to the automotive industry by the General Motors Radio Corporation and by the Studebaker-Kennedy Radio combination. In addition to the use of radio in automobiles such a combination offers possibilities of equalizing the seasonal demand on manufacturing and distributing facilities.

Radio Sales.—During 1929 radio sales show about the usual seasonal variation, with 23 per cent during the first quarter; 16 per cent during the second; 23 per cent during the third; and 38 per cent in the last quarter, according to Department of Commerce reports.

STATISTICS OF MANUFACTURES

By LeVerne Beales

Chief Statistician for Manufactures, Bureau of the Census

BIENNIAL CENSUS FOR 1929

Scope of Questionnaires.—The Biennial Census of Manufactures covering production in 1929 was taken in 1930. This census not only falls into the biennial series, inaugurated a decade ago, but is also included in the decennial series, which began 120 years ago and has been unbroken since 1840. In order that the statistics might be made comparable with those of earlier decennial years, the questionnaires were considerably amplified as compared with those used at biennial canvasses. Moreover, a number of new inquiries were added; namely, one in regard to migration of industrial establishments, another in regard to hours of labor of individual wage earners as distinguished from the prevailing hours of labor in the factory, another providing for the separate reporting of idle power equipment, and still another calling for data as to the channels through which the products were sold. This last inquiry was placed on the questionnaire in order to obtain data needed for the purposes of the Census of Distribution, authorized, for the first time, by the Fifteenth Decennial Census Act.

Materials Cost and Sales.—The most important innovations, however, were changes in the form of two of the major inquiries on the schedule. The cost-of-materials inquiry, which in previous census years had included the cost of "mill supplies" (lubricating oil, minor parts for replacement, etc.), in addition to that of materials which actually entered into the finished products, was revised so as to exclude data for such supplies; and the inquiry in regard to output, which in the past had covered *production* during the census year, now refers to *sales* (shipments or deliveries). The purpose of both these changes was to make it more convenient for the manufacturers to supply the data. The latter does not appear to have affected, to any considerable extent, the comparableness of the 1929 figures with those for earlier years; but the former has naturally resulted in a slight reduction in the cost-of-materials item and a corresponding slight increase in the item "value added by manufacture" (calculated by subtracting cost of materials from value of products).

Preliminary Census Reports.—All the changes above referred to were based upon recommendations made by an Advisory Committee of 25 members appointed by the Secretary of Commerce. The canvass began promptly in January but proceeded slowly. The Census Bureau has always found it impossible to induce all manufactures, or even a majority of them, to make their returns promptly and to use care in answering all questions correctly and completely; but at the recent census the delay in getting in the returns was greater than in preceding years. Several causes, among which may be mentioned the industrial depression and the increased length of the questionnaire, contributed to this delay. At this writing (November) the returns for a number of exceedingly important manufacturers are still outstanding, and as a result the preliminary reports for some of the most important industries have not been given out for publication. A summary covering all industries was, however, published under date of November 8. In the preparation of this summary estimated data were used for manufacturers who had not reported, but it is belived that the margin of error does not amount to more than a fraction of one per cent. The canvass is approaching completion, and it is expected that all outstanding returns will be received in time to enable the Census Bureau to complete the publication of its series of preliminary reports for individual industries by the close of the year.

ANALYSIS OF 1929 SUMMARY

The summary referred to follows. The figures for 1929 are, of course, preliminary and subject to revision. In making use of the statistics for cost of materials and value of products it should be remembered that they include large but indeterminable amounts of duplication resulting from the use of the products of some industries as materials by others. For example: Manufacturers of motor-vehicle tires report the cost of crude rubber and other materials used and the total value of tires made, including those sold to motor-vehicle manufacturers for installation on new vehicles. The latter manufacturers in turn report the total cost of all materials used, including tires purchased, and the total value of vehicles manufactured, including that of the tires. Thus the cost of the crude rubber and other materials used by the tire manufacturers is included twice in the combined cost of materials of all industries (first directly and next as a part of the cost of tires purchased by the motor-vehicle manufacturers); and the value of the tires installed on new vehicles is included twice in the combined value of products of all industries. (As a rule, whatever duplications occur are between different industries and are not found to any considerable extent within individual industries.) The value added by manufacture (see footnote 4) is, however, free from the duplication found in the gross value of products and therefore represents approximately the actual value created by the manufacturing industries of the country.

SUMMARY FOR ALL MANUFACTURING INDUSTRIES: 1929, 1927, AND 1919

	1929	1927	1919	Per cent of increase or decrease (—)	
				1927–1929	1919–1929
Number of establishments	199,268	191,866	214,383	3.9	—7.1
Wage earners (average for the year)[1]........	8,550,284	8,349,755	9,000,059	2.4	—5.0
Wages [2]	$11,271,016,618	$10,848,802,532	$10,461,786,869	3.9	7.7
Cost of materials, containers for products, fuel, and purchased electric current [2], [3] ...	$37,357,631,108	$35,133,136,889	$37,232,702,390	(3)	(3)
Value of products [2].....	$68,453,486,518	$62,718,347,289	$62,041,795,316	9.1	10.3
Value added by manufacture [4]	$31,095,855,410	$27,585,210,400	$24,809,092,926	(4)	(4)

[1] Not including salaried employees. The average number of wage earners is based on the numbers reported for the several months of the year. This average somewhat exceeds the number that would have been required for the work performed if all had been continuously employed throughout the year, because of the fact that manufacturers report the numbers employed on or about the 15th day of each month, as shown by the payrolls, usually taking no account of the possibility that some or all of the wage earners may have been on part time or for some other reason may not actually have worked the entire month. Thus in some cases the number reported for a given month exceeds the average for that month.

[2] Manufacturers' profits cannot be calculated from the census figures because no data are collected for certain expense items, such as interest on investment, rent, depreciation, taxes, insurance and advertising.

[3] The cost-of-materials items for 1927 and 1919 are not strictly comparable with the corresponding item for 1929 because of the fact that the schedules for 1927 and 1919 provided for the inclusion of data on the cost of mill or shop supplies, whereas the schedule for 1929 stated that such data should not be included. For this reason no per cent is shown.

[4] Value of products less cost of materials, containers for products, fuel and purchased electric current. The figures for 1927 and 1919 are not strictly comparable with the figures for 1929 because of the change in the cost-of-materials items. (See footnote 3.)

MANUFACTURING VALUES AND PRICES

The value of products as given in the above table shows an increase of 9.1 per cent for the period 1927 to 1929. A weighted average of the indices of wholesale prices of semifinished and finished products (compiled by the Bureau of Labor Statistics) shows an increase of 1.4 during the same period, from 94.8 to 96.2 (based on 100 for 1926). If we take this increase in prices into account, it appears that the rate of increase in actual *quantity* of manufactured goods produced in 1929 as compared with 1927 was approximately 8 per cent.

MANUFACTURING VOLUME

Production Increase. — Several years ago Professor Edmund E. Day, of the University of Michigan, and Dr. Woodlief Thomas, of the Federal Reserve Board, made a careful study of the manufacturers—census statistics covering the period from 1899 to 1925, and estimated the rate of increase in quantity of manufactured products during that period. A later calculation made according to the method of Day and Thomas carried the estimate forward to 1927 and gave 172 per cent as the rate for the 28-year period 1899-1927; and if 8 per cent be accepted as the rate for the recent two-year period, then the rate of quantitative increase for the 30-year period becomes 194 per cent. (2.72 x 1.08 = 2.94.)

Wage Earners and Output.—During the same period the number of wage earners increased by 83.1 per cent, from 4,669,156 in 1899 to 8,550,284 in 1929. This means that the average quantity of output per wage earner in the later year was 61 per cent more than in the earlier one. (2.94 ÷ 1.83 = 1.61.) This percentage serves as a rough measure of the effect of the mechanization of industry during the present century; and it appears all the more striking when the marked decrease in the num- of hours of the working day is taken into account.

Tabulation.—If we break down the 30 years into three periods, each a decade in length, we obtain the following results:

Period	Per cent of increase or decrease in—		
	Wage earners	Aggregate quantity of output	Quantity of output per wage earner
1899–1909	39	59	14
1909–1919	39	34	—4*
1919–1929	—5*	37	44

* Decrease.

Analysis.—It will be seen that the increases both in aggregate quantity of output and in output per wage earner were by no means uniform during the three decades. The principal reason for this lack of uniformity is found in the fact that the year 1919 was one of abnormal industrial activity, during which the largest recorded volume of output up to that time was produced through the employment of many wage earners, including an abnormally large proportion of inefficient ones, rather than through the efficient use of improved equipment and methods. During the following decade, however, the effect of the mechanization of industry and the improvement in methods was much greater than during any preceding period of equal length.

COGNATE SOCIETIES

MANUFACTURES

American Assn. of Creamery Butter Manufacturers, 208 S. LaSalle Street, Chicago, Ill.

American Assn. of Oil Burner Manufacturers, 350 Madison Ave., New York City.

American Assn. of Woolen and Worsted Manufacturers, 45 E. 17th Street, New York City.

American Automobile Assn., Pennsylvania Ave. at 17th Street, Washington, D. C.

American Bottlers of Carbonated Beverages, 726 Bond Bldg., Washington, D. C.

American Brush Manufacturers Assn., 505 Arch St., Philadelphia, Pa.

American Hardware Manufacturers' Assn., 342 Madison Ave., New York City.

American Institute of Steel Construction, 350 Madison Ave., New York City.

American Iron and Steel Institute, 75 West Street, New York City.

American Iron, Steel and Heavy Hardware Assn., 47 W. 34th St., New York City.

American Paper and Pulp Assn., 18 E. 41st Street, New York City.

American Petroleum Institute, 250 Park Avenue, New York City.

American Zinc Institute, Inc., 27 Cedar Street, New York City.

Electrical Manufacturers Council, 30 E. 42nd St., New York City.

National American Wholesale Lumber Assn., 41 E. 42nd Street, New York City.

National Assn. of Cotton Manufacturers, 80 Federal Street, Boston, Mass.

National Assn. of Electrical Contractors and Dealers, 15 W. 37th Street, New York City.

National Assn. of Ice Industries, 163 W. Washington Street, Chicago, Ill.

National Assn. of Manufacturers of the U. S. of America, 11 W. 42nd. St., New York City.

National Assn. of Wool Manufacturers, 80 Federal Street, Boston, Mass.

National Automobile Chamber of Commerce, 366 Madison Ave., New York City.

National Electric Light Assn., 420 Lexington Ave., New York City.

National Electrical Manufacturers Assn., 420 Lexington Ave., New York City.

National Lumber Manufacturers' Assn., Transportation Building, Washington, D. C.

National Machine Tool Builders' Assn., 630 Vine St., Cincinnati, O.

National Metal Trades Assn., 50 Broadway, New York City.

National Paint Oil and Varnish Assn., 18 E. 41st. St., New York City.

New York Lumber Trade Assn., 5624 Grand Central Terminal, New York City.

Rubber Assn. of America, Inc., 250 W. 57th. St., New York City.

Silk Assn. of America, 468 Fourth Ave., New York City.

United States Brewers Assn., 55 W. 42nd. St., New York City.

United Typothetae of America, Tower Building, 14th. and K Sts., N. W., Washington, D. C.

TRANSPORTATION AND COMMUNICATION

Aerial League of America, 280 Madison Ave., New York City.

American Assn. of Railroad Superintendants, 111 Union Station, St. Louis, Mo.

American Electric Railway Assn., 292 Madison Ave., New York City.

American Marine Assn., 414 Washington St., New York City.

American Railway Assn., 30 Vesey St., New York City.

American Railway Engineering Assn., 59 E. Van Buren St., Chicago, Ill.

American Road Builders Assn., 914 National Press Building, Washington, D. C.

American Steamship Owners Assn., 11 Broadway, New York City.

Associated Traffic Clubs of America, 418 S. Market St., Chicago, Ill.

Committee on Public Relations of the Eastern Railway Presidents' Conference, 143 Liberty St., New York City.

Council of American Shipbuilders, Inc., 50 Broadway, New York City.

International Amateur Radio Union, 1711 Park St., Hartford, Conn.

Maritime Assn. of the Port of New York, 78 Broad St., New York City.

National Aeronautic Assn., 910 17th. St., Washington, D. C.

National Association of Broadcasters, 1265 Broadway, New York City.

National Assn of Owners of Railroad Securities, 11 E. 36th. St., New York City.

National Council of American Importers and Traders, Inc., 45 E. 17th. St., New York City.

National Highway Traffic Assn., 12 E. 53rd St., New York City.

National Industrial Traffic League, 58 E. Washington Street, Chicago, Ill.

New York State Waterways Assn., 1012 Prudential Building, Buffalo, N. Y.

North American Export Grain Assn., Inc., 2 Broadway, New York City.

Railroad Securities Owners Assn., 501 Chandler Building, Washington, D. C.

Railway Business Assn., 1406 Packard Building, Philadelphia, Pa.

Traffic Assn. of America, 27 William St., New York City.

Traffic Vigilance League, Inc., 186 Fifth Ave., New York City.

United States Ship Operators' Assn., Inc., 149 Broadway, New York City.

Western Railways' Committee on Public Relations, 105 W. Adams Street, Chicago, Ill.

PART FIVE
SOCIAL CONDITIONS AND AIMS

DIVISION XIV
POPULATION AND IMMIGRATION

FEDERAL CENSUS OF 1930

BY LEON E. TRUESDELL
CHIEF STATISTICIAN FOR POPULATION, U. S. BUREAU OF THE CENSUS

CONTINENTAL UNITED STATES

Summary of Census Increase.—The growth of the population since the first census in 1790 is indicated by the following table, which gives the figures for each census, with the number and percentage of increase over the preceding census:

POPULATION OF UNITED STATES
1790 to 1930

Year	Population (Census figures)	Increase Over Preceding Census	
		Number	Per Cent
1930	122,775,046	17,064,426	16.1
1920	105,710,620	13,738,354	14.9
1910	91,972,266	15,977,691	21.0
1900	75,994,575	13,046,861	20.7
1890	62,947,714	12,791,931	25.5
1880	50,155,783	11,597,412	30.1
1870	38,558,371	7,115,050	22.6
1860	31,443,321	8,251,445	35.6
1850	23,191,876	6,122,423	35.9
1840	17,069,453	4,203,433	32.7
1830	12,866,020	3,227,567	33.5
1820	9,638,453	2,398,572	33.1
1810	7,239,881	1,931,398	36.4
1800	5,308,483	1,379,269	35.1
1790	3,929,214	....	....

Population Growth.—The population of continental United States on April 1, 1930, the date of the Fifteenth Census, was 122,775,046, as compared with 105,710,620 on Jan. 1, 1920, the date of the last preceding census. This represents an increase of 17,064,426, or 16.1 per cent. The absolute increase is larger than that shown for any previous decade, and the percentage of increase is higher than that shown for the decade 1910-1920, which was only 14.9 per cent. In comparing these two percentages, however, allowance should be made for the fact that the period between the census of 1910 and 1920 was less than a full decade, and that between the census of 1920 and 1930 was more than a full decade. An increase of 16.1 per cent for 123 months (the time between Jan. 1, 1920, and April 1, 1930) is equivalent to 15.7 per cent for an exact 10-year period; and the 1920 increase for 116½ months (the time between April 15, 1910, and Jan. 1, 1920) is equivalent to 15.4 per cent for 120 months. Making this adjustment, therefore, the rate of increase for the decade just completed is only slightly higher than that for the preceding decade.

Intercensal Estimates. — For many purposes it is necessary to have population figures for dates within the census decade. As a basis for computing birth rates, death rates, and per capita expenditures, for instance, annual figures are required. To meet this need, the Census Bureau regularly makes estimates for July 1 of each year. Upon the completion of a new census, the estimates made during the preceding decade are revised and brought into agreement with the census returns. The estimates shown in the first column of the marriage and divorce table are such revised estimates, obtained by prorating over the period between 1920 and 1930 the actual increase shown by the 1930 census. The revised estimate for July 1, 1929, for example, is obtained by subtracting from the 1930 census population 9/123 of the decennial increase. The estimate for any other date, either for the United States or for any state or city, can be obtained in the same manner. First, divide the decennial increase by 123 to get the amount of increase assigned to one month; second, multiply this monthly increase by the number of months earlier than April 1, 1930, and subtract the product from the 1930 census figure (or multiply the monthly increase by the number of months subsequent to Jan. 1, 1920, and add to the 1920 census figure). Provisional estimates for dates subsequent to April 1, 1930, may be obtained by adding to the 1930 census figure the assumed increase, computed in the same way, for the number of months elapsed since the census date.

BIRTHS AND DEATHS

Registration Area.—Among the most fundamental of the current statistics relative to population are those of births and deaths. Neither birth registration nor death registration has yet reached such a stage of development in all of the states of the Union that the figures are considered satisfactory for compilation by the Census Bureau. The registration area, which is made up of those states having satisfactory registration systems, is being gradually extended, however, until it now includes all but one of the states and about 95 per cent of the population. Beginning with 1925 it has been considered that the returns for births and deaths were sufficiently complete to justify their use as a basis for estimating the increase from year to year in the population of the United States. (The estimates presented in the table of marriages and divorces are revised estimates, derived, as explained above, from the decennial census figures; estimates for dates subsequent to the 1930 census date are being computed, however, on the basis of the birth rates and death rates, as were the original estimates for the years from 1925 to 1929.)

Summary of Recent Data.—The following table gives for each year from 1920 to 1929, the number of births and deaths, the annual rates per 1,000 of the population, and a 3-year moving average rate which indicates the trend with much less variation on account of fortuitous conditions than the single year rates:

BIRTHS AND DEATH IN THE REGISTRATION AREA

1920 to 1929

(The birth registration area included 59.8 per cent of the total population of the country in 1920 and 94.7 per cent in 1929; the death registration area included 82.2 per cent of the population in 1920 and 95.7 per cent in 1929.)

Year	Births			Deaths		
	Number	Rate per 1,000 of the population		Number	Rate per 1,000 of the Population	
		Annual	3-year Moving Average		Annual	3-year Moving Average
1929	2,169,920	18.9	....	1,386,363	11.9	....
1928	2,233,149	19.7	19.7	1,378,675	12.0	11.8
1927	2,137,836	20.6	20.3	1,236,949	11.4	11.9
1926	1,856,068	20.6	20.9	1,285,927	12.2	11.8
1925	1,878,880	21.4	21.6	1,219,019	11.8	12.0
1924	1,930,614	22.6	22.2	1,173,990	11.8	12.0
1923	1,792,646	22.4	22.5	1,193,017	12.3	12.0
1922	1,774,911	22.5	23.1	1,101,863	11.8	11.9
1921	1,714,261	24.3	23.5	1,032,009	11.6	12.2
1920	1,508,874	23.7	....	1,142,558	13.1	....

FUTURE POPULATION GROWTH

Indications from Present Rate of Increase.—There is much interest at the present time in the probable growth of the population of the United States over a considerable period into the future. American industry has formed the habit of expecting a continuous and rather rapid growth in the population, to provide a continuously expanding market for its products; and failing this it will be confronted with the necessity for significant readjustments. It is becoming evident, however, that even the present rate of growth of around 1 per cent per year is not likely to continue for very long. Two groups of men who have been studying the problem from two different angles have recently revised the estimates which they made three or four years ago and are now in approximate agreement in a forecast that within 40 years the population of the United States will have almost ceased to grow and that it will become nearly stationary somewhere between 160,000,000 and 170,000,000.

Declining Rate of Natural Increase.—Any forecast of the population for even a moderate way into the future must be affected seriously by recent trends in the birth and death rates, especially in the birth rate, which has decreased from 23.7 in 1920 to 21.4 in 1925, and still further, to 18.9 in 1929. While the death rate has also declined, its decrease has been much smaller, and as a net result the rate of natural increase (birth rate minus death rate) has declined from 10.7 per thousand in 1920 to 7.0 per thousand in 1929. The present low death rate (11.9 in 1929) cannot be long maintained, however, in view of the fact that the population is rather rapidly increasing in average age. In 1870, children under 10 years of age formed 39.2 per cent of the population; in 1920, only 31.7 per cent. In 1870, persons 65 years of age and over formed only 14.9 per cent of the population; in 1920, 20.8 per cent. The medium age in 1870 was 20.1; in 1920, 20.2 years. The rate of natural increase, therefore, is almost sure to be cut in the near future both by a further decrease in the birth rate and by an increase in the death rate.

POPULATION CLASSIFICATION

Restrictions.—The published reports of the population census show the figures classified under about twenty different headings, of which space will permit the presentation here of only a few. At the present writing (December, 1930) the tabulation of the 1930 census returns has progressed only as far as to make available the total population and its classification as urban and rural. For any other classifications, therefore, the 1920 figures are still the latest available. (Other classifications will be made public, state by state, in the form of bulletins appearing through the spring of 1931; and the United States totals may be expected early in the summer of that year.)

Urban and Rural.—The total population returned in the 1930 census was 122,775,046. Of this number, 68,955,521, or 56.2 per cent, were living in urban territory, which includes all cities and other incorporated places having 2,500 inhabitants or more together with a small number of other places having urban characteristics and added to the 1930 urban classification under a special rule. The remainder, of 53,819,525, comprising 43.8 per cent of the total, were living in rural territory. The percentage urban in 1920 was 51.4; in 1910, it was 45.8; in 1900, 40.0; in 1890, 35.4; and in 1880, the earliest year for which figures are available on the present basis, 28.6 per cent.

Farm Population.—The farm population, which was first shown separately in 1920, numbered 31,614,269, representing 29.9 per cent of the total population, and 61.5 per cent of the rural population. The 1920 figures included certain farm laborers (and their families) not actually living on farms, estimated to number about 600,000. The farm resident population in 1925, as returned in the farm census of that year, numbered 28,981,668, representing a decrease of about 2,000,000 as compared with 1920.

While the farm population figures for 1930 are not yet available, it is believed that the decrease has continued rather rapidly since 1925.

Sex, Age and Race.—Other important classifications of the 1920 population of the United States are as follows: by sex, 53,900,437 males and 51,810,189 females; by race, 94,820,915 white, 10,463,131 Negro, and 426,574 of other races; by age, under 5 years, 11,573,230; 5 to 14 years 22,039,212; 15 to 24 years, 18,707,577; 25 to 44 years, 31,278,522; 45 to 64 years, 17,030,165; 65 years and over, 4,933,215, and age not reported, 148,699; white population by nativity, native white of native parentage, 58,421,957; native white of foreign or mixed parentage, 22,686,204, and foreign-born white, 13,712,754.

MARRIAGE AND DIVORCE

Data.—Marriage and divorce figures have been compiled for various periods beginning with 1867 and have been published annually beginning with 1922. The following table summarizes the returns from 1922 to 1928:

MARRIAGES AND DIVORCES IN THE UNITED STATES
(1922 to 1929)

Year	Population (estimated as of July 1)	Marriages		Divorces		
		Number	Per 1,000 of Population	Number	Per 1,000 of Population	Per 100 Marriages Performed
1929	121,526,429	1,232,559	10.14	201,475	1.66	16.4
1928	119,861,607	1,182,497	9.87	195,939	1.63	16.6
1927	118,196,785	1,201,053	10.16	192,037	1.62	16.0
1926	116,531,963	1,202,574	10.32	180,853	1.62	15.0
1925	114,867,141	1,188,334	10.35	175,449	1.53	14.8
1924	113,202,319	1,184,574	10.46	170.952	1.51	14.4
1923	111,537,497	1,229,784	11.03	165,096	1.48	13.4
1922	109,872,675	1,134,151	10.32	148,815	1.35	13.1

Classification of Divorces.—The divorces as reported are classified according to cause, party to whom granted, etc. Of the 199,335 divorces granted in 1929 for which detailed information was received, 57,148 were granted to the husband, and 142,187 to the wife. Classified according to cause: 81,284 were granted for cruelty; 59,061 for desertion; 16,510 for adultery; 7,741 for neglect to provide; 3,589 for drunkenness; and 22,150 for other causes and combinations of causes. Of the whole number of divorces, 173,696 were reported as uncontested cases. Where the parties had been married less than five years formed 35.6 per cent of the divorces, and another 28.7 per cent was made up of cases where the parties had been married from 5 to 9 years. In only 74,204 cases, or 37.2 per cent of the cases, was it reported that children were affected by the divorce.

Annulments.—In addition to the divorces listed above, there were reported in 1929, 4,400 cases of annulment of marriage, as compared with 4,237 in 1928. More than half of the annulments in both years were reported from two states, New York and California.

RACE CONDITIONS IN UNITED STATES

By Harry H. Laughlin
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THE CENSUS OF 1930

The Bureau of the Census announced officially the total population of the United States for 1930 at 122,775,046, a gain of 17,064,426 or 16.1 per cent from 1920. The Bureau has not yet announced its analysis of total population by color and nativity which are of principal concern in a study of race conditions. However, this analysis was, on Nov. 22, announced for the District of Columbia, showing that the white population of the District which, in 1920, constituted 74.7 per cent of the total, dropped in 1930 to 72.7 per cent. This was due largely to the influx of negroes who, in 1920, constituted 24.1 per cent of the total population of the District, while in 1930 this figure had risen to 25.9 per cent. Still the native white stocks of the District seem to be holding their own in comparison with the foreign-born white stocks, the percentage of foreign-born whites having declined from 6.5 per cent in 1920 to 6.1 in 1930. This is a logical outcome of the restriction of foreign immigration, and the influence of time which, with such restriction, tends to raise the proportion of native-born.

RACE INTEGRITY LAWS

In state legislation with reference to race by far the outstanding movement has been the enactment of the so-called Race Integrity Laws of several states, particularly in the South. Sponsored largely by Dr. W. A. Plecker, State Registrar of Virginia and led by Virginia, the Race Integrity Laws have for their purpose the prevention of marriage between persons of white stock and persons who have any negro blood whatsoever in their ancestry. On March 4th, 1930, the Governor of Virginia approved the following amendment making still more rigid its former Racial Integrity Law, so that Section 67 now reads: "Every person in whom there is ascertainable any negro blood shall be deemed and taken to be a colored person, and every person not a colored person having ¼ or more of American Indian blood shall be deemed an American Indian; except that members of Indian tribes living on reservations allotted them by the Commonwealth of Virginia having ¼ or more of Indian blood and less than 1/16 of negro blood shall be deemed tribal Indians so long as they shall be domiciled on said reservations."

RECENT IMMIGRATION POLICY AN RACIAL TRENDS

Analysis.—The present policy i based upon total numbers, race an individual quality, the latter covering both personal and family-stoc standards. The current tendenc seems to be directed more and mor toward the breeding-stock basis; tha is, the basis which considers the individual immigrant as the potentia parent of future American citizen and as such must be well endowed b heredity in body, mind and spirit The present is a long-time policy rather than one which looks only t the present and the immediate future The biological element provides th long time element; the economic element the immediate expediency.

Chinese Exclusion.—The foundation for the new biological-economi immigration policy, which is now generally accepted, is the Chinese Exclusion Act of 1882 and the Contrac Labor Exclusion Act of 1885. Th Chinese were excluded by Act of Ma 6, 1882, for a period of 10 years. A bill, passed a few weeks earlier an calling for the exclusion of the Chinese for 20 years, was vetoed b President Arthur. After som changes, including a limitation o time to 10 years, the President signe the bill. In 1892, the application o this law was extended still anothe 10 years. In 1902 the law was further extended until such time as the matter might be regulated by treaty. Treaty regulation failing, Congres made the Chinese Exclusion Act permanent in 1904.

Hindu and Malay Exclusion.—By the Act of Feb. 5, 1917, Congres effectively excluded Hindu and Mala immigration. This was done by th exercise of undisputed sovereign righ of the United States to control immigration. In this particular instanc the method of control consisted i laying out on the earth's surface, b latitude and longitude, certain area which covered the home territories o the excluded races. This Oriental Exclusion Act included practically al of Southern Asia and the East Indies except Persia and the Philippine Islands. China was not included i the area because the previous Acts made it unnecessary; Japan was not included because the "gentleman's agreement" was still in practical effect and the method of permanent legislative control of Japanese immigration had not yet been decided upon.

Japanese Exclusion.—The law of 1924 definitely completed the exclusion of Oriental races, including the Japanese, as permanent immigrants. This was achieved legislatively by limiting immigration to persons eligible for naturalization. The previous laws covering the latter require that a person, to be eligible for naturalization, must be of a Caucasion race or a person of African descent.

Filipino Immigration.—The inhabitants of the Philippine Islands continue (1930) to come to Hawaii and the Western Coast, largely supplanting the now prohibited Japanese and Chinese immigrant. The Filipinos are not citizens of the United States, but the islands being a possession of the United States their inhabitants have thus far been granted free immigration privileges. As the year closes Congress is considering whether Filipino immigration shall be permitted to follow its natural course, or whether it will be restricted by law. It is thus not only a racial and an economic problem, but it involves also a delicate political situation.

BIOLOGICAL AND ECONOMIC PRINCIPLES FOR IMMIGRATION CONTROL

Literacy Test.—In its second series of major enactments the new policy found its first legislative expression in the Act of 1917, which was passed over the veto of President Wilson, and which provided for the limitation of immigrants to individuals who could pass a certain very low literacy test.

Quota Limitation.—The second enactment of this series came in 1921 with the first quota-act, which limited the total number of quota-immigrants annually admissible to 356,995, and which allowed annually immigrants from each nation equal to 3 per cent of the total number of the nationals of each country found in the United States by the census of 1910. This quota-act was to have expired May 11, 1922, but it was extended by Congress to June 30, 1924.

Johnson Law.—The third step came in 1924 with the enactment of the Johnson Law which extended the principle of the law of 1921 by providing for the limitation of permissible quota-immigrants to 164,667 annually. The basis of this Act is 2 per cent of each nationality of aliens found in the United States by the Census of 1890. This was a move in the direction of greater numerical limitation as a whole, and also tended to admit relatively more of those nationalities known as the older American racial stocks.

National Origin Basis.—It provided also that, beginning with July 1, 1927, the "National Origins" basis should become effective. This provided for the distribution of admissible quota-immigrants among the different foreign countries according to their several contributions to the total blood of the American people as deduced from the Census of 1890. As a matter of fact the date for change from the "2 per cent-1890 basis" to the "National Origins basis" was postponed by Congress so that the latter actually went into effect July 1, 1929. National Origins provided also for the total limitation of quota-immigrants to 150,000 per year.

PAN-AMERICAN MIGRATION RECIPROCITY

In keeping with the spirit of Pan-American amity the law of 1924 placed no quota or other numerical limitations on immigrants from the other countries of the Western Hemisphere. Of course the personal and family-stock qualifications apply, but no numerical limits were set. White persons and negroes may, under the law, so far as race or country are concerned, come freely into the United States from all other American countries. The matter of Indians coming from other American countries, and as being neither white nor black, was never tested by the courts.

IMMIGRATION

Mexico.—The Pan-American non-quota provision of the law of 1924 resulted in the migration, either as permanent residents or as seasonal labor, of many thousands of Mexicans into the Southwestern States. It is generally agreed that many times the legally recorded number entered illegally. The matter was rapidly becoming an issue between the two countries, and a political issue in the States. The problem was how to restrict Mexican immigration without doing hardships to the employers of labor in the Southwest or offending Mexico. Meanwhile an executive order, equally applicable to all nations, seems to have solved the problem temporarily. The order refused admission of any one "likely to become a public charge." With so much unemployment in the States, this meant excluding nearly every would-be immigrant, because few of them have sufficient economic resources to maintain themselves long without employcent.

For the several past fiscal years, each ending June 30, legal Mexican immigration into the United States was as follows:

1925	32,378
1926	42,638
1927	66,766
1928	57,765
1929	38,980
1930	11,915

With the restoration of "good times," the existing order may not be so effective, and Congress may again be called upon to determine a policy.

Total Immigration.—Commissioner General of Immigration reports that for the year ended June 30, 1930, there were admitted to the United States a total of 446,214 aliens of whom 241,700 are classed as immigrants. During the same period a total of 272,425 aliens departed from the United States. This left net increase of 173,789 aliens for the year. Of the total immigration for this year 198,004 persons were listed as non-quota immigrants and 141,497 as quota immigrants.

Control of Total Number of Immigrants.—The new policy was further developed by the nation as a consequence of the high tides of European immigration just before and just after the World War. The previous high points of immigration had been 1907 when 1,285,349 immigrants arrived, and again in 1914 with 1,218,480, then after the War the tide began rising again. Students of the problem now agree that the effect of the recent statute has been to keep alien immigration practically within the legislatively intended bounds. The early hardships incident to these laws are now being greatly reduced. The principal one of these hardships consisted in preventing many near blood-kin and marriage relations of legal immigrants being debarred from entry to rejoin their families in this country. Quota-preference given to such kin and relation, and the passage of years under the new limitations, have practically solved this difficulty.

Sex of Immigrants.—In racial trend the sex of immigrants is very important. It has been shown that the fertility of the nation depends upon the number of its women of child-bearing ages, generally from 15 to 45 years of age. When the immigrants are largely males they must find mates among the already established women of the receiving country. If the immigrant males are from the more favored races and relatively high in the social and economic scales they marry into the so-called "best" families of the receiving country. If, on the other hand, the immigrant males are of a non-favored race or are low in economic and social standards, their mates must be found among the so-called "lower classes" of the receiving country. All this, of course, has its effect upon the racial trends of the receiving country as influenced by immigration. During the last fiscal year the population of the United States increased by 69,630 alien males and by 104,159 alien females. Doubtless this large number of females is due to the bringing in of wives and dependents of immigrants already established in the United States, and does not mean that immediately there is an excess of alien women many of whom will find mates among the older racial stocks of the country.

NATURALIZATION

Complaints about the "unsatisfactory working of the melting pot" which were so markedly stressed immediately following the high points of alien immigration (1907, 1914 and the post-war period) were not so marked in 1930. Doubtless the cause of this phenomenon is that immigration has now, for several years, been restricted in numbers and limited to races more compatible with the descendants of European stocks already established in the United States. Although the number of immigrants has been reduced the number of naturalization certificates issued remains high. Since 1925 this figure runs as follows—

1925	152,475
1926	146,331
1927	199,804
1928	233,155
1929	224,728
1930	169,377

RACIAL TRENDS IN CHARACTER OF CURRENT IMMIGRATION

Commissioner General of Immigration, Harry E. Hull, has issued the following table showing the increase or decrease during the year 1930 of aliens from each foreign country in the United States. This is the net result of the coming and going of aliens and includes both immigrants and non-immigrants quota and non-quota. Contrasted with past years it shows a trend again toward the old American stocks.

Race or People	Increase+ or Decrease—
Total	+173,789
African (black)	+ 1,974
Armenian	+ 762
Bohemian and Moravian	— 347
Bulgarian, Serbian and Montenegrin	— 513
Chinese	— 1,428
Croatian and Slovenian	+ 989
Cuban	+ 145
Dalamatian, Bosnian and Herzegovinian	— 479
Dutch and Flemish	+ 3,152
East Indian	+ 22
English	+ 21,191
Finnish	+ 71
French	+ 12,259
German	+ 30,681
Greek	+ 1,820
Hebrew	+ 13,015
Irish	+ 32,155
Italian (north)	+ 1,188
Italian (south)	+ 14,301
Japanese	— 2,116
Korean	— 16
Lithuanian	— 32
Magyar	+ 1,106
Mexican	+ 5,390
Pacific Islander	— 56
Polish	+ 1,704
Portugese	— 625
Rumanian	— 361
Russian	+ 2,313
Ruthenian (Russniak)	+ 467
Scandinavian (Norwegians, Danes and Swedes)	+ 3,811
Scotch	+ 26,303
Slovak	+ 1,893
Spanish	— 925
Spanish American	+ 1,590
Syrian	+ 598
Turkish	+ 156
Welsh	+ 1,880
West Indian (except Cuban)	— 583
Other Peoples	+ 335
Sex	
Male	+ 69,630
Female	+104,159

IMMIGRATION REGULATION AND POPULATION CONTROL

Major Factors.—There are three major factors in population control—immigration, mate selection and size of family. The history of the new immigration policy has been to demonstrate the fact that for a modern sovereign nation, which is still primarily an immigrant-receiving nation, the control of immigration by law is the most effective means by which it can influence directly its own racial trends. The other fundamental factors for influencing such trends, mate selection and differential fecundity, are much more intricate in nature and difficult to control; they are controlled largely by education, custom, and circumstances. Legislation effects these only indirectly.

Results.—The new or biological-economic and still developing immigration policy of the United States has up to the end of 1930, brought about the following results:—(a) limited immigration in quota numbers to less than one-fifth its highest annual rate; (b) effected the distribution of immigration more nearly according to the racial origins of the American people; (c) raised the personal and family-stock standards of the individual immigrant; (d) the better enforcement of the immigration laws, and increased activity in the deportation of alien criminals and persons who have entered the United States illegally; (e) instituted overseas examination of would-be immigrants thus insuring more accurate data in reference to the immigrant's qualifications, and prevented many hardships, both economic and moral; (f) by the strict application of the "likely-to-become-a-public-charge" provision of the immigration statutes, greatly reduced the total number of immigrants in time of economic stress, which has enabled a more rigid selection of candidates for admission; (g) made the conditions favorable for the continued migration northward of large numbers of Southern Negroes, these taking the places formerly filled by European immigrants as unskilled laborers; (h) permitted a flood of Mexican immigration in time of prosperity and practically shut it out in hard times; (i) permitted the continued immigration of Filipinos to the Western States of the Continent

IMMIGRATION PROBLEMS

By Peter F. Snyder

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ANALYSIS OF IMMIGRATION

Admissions and Departures.—Figures of the past fiscal year show the smallest immigration to the United States since 1879, if exception of the two war years—1918 and 1919—be noted. The year ended June 30, 1930, marked a decline of 13.57 per cent from the immigration figures of the previous year, which in turn was 9 per cent under the year ended June 30, 1928. In the most recent year 446,214 aliens were admitted, as compared with a total of 479,327 for the year ended June 30, 1929. During the 1930 fiscal year 272,425 aliens departed, as compared with 252,498 departures during 1929. Therefore, for the past fiscal year there was a net gain of 173,789 as compared with a net gain of 226,829 in alien population for 1929. Of 446,214 aliens admitted, 241,700 were immigrants or newcomers for permanent residence in this country. The comparable figure of the previous year was 279,678. Aliens returning from temporary trips abroad, or coming here for a visit, numbered 204,514, as compared with 199,649 in the fiscal year 1929. Of the 272,425 aliens who departed from the United States during the past year, 221,764 were aliens who had been here for a short stay or who intended to return to the United States after visiting a foreign country. The remaining 50,661 departed without expressing an intention to return.

Immigration Sources.—During the past fiscal year immigrant females numbered 124,674 while immigrant male were 117,026. Germany sent more men and boys than women and girls, figures for the two classes being 13,382 male and 13,187 female. From Greece, however, females outnumbered males 1,886 to 405, and from Italy females were preponderant, 14,372 to 7,955. Sweden sent the largest proportionate male contingent, men and boys outnumbering women and girls 1,925 to 1,184. Poland sent 5,341 female and 3,890 male. Yugoslavia sent 1,190 female and 547 male. The Netherlands sent 1,667 male and 1,071 female. Most remarkable progress has been made in effecting reduction of western hemisphere immigration. In previous fiscal years the influx from this area has amounted to almost 41 per cent of the total. In the year ended June 30, 1930, it was reduced to 36 per cent. Reduction of immigration from Mexico was drastic. Due to measures inaugurated by American consular officers under State Department direction

Mexico's contribution was only 12,703, as compared with 40,154 in the previous year. The reduction was 68 per cent. Mexican immigration, instead of amounting to 15 per cent of the total, as in the fiscal year 1929, was only 5 per cent of the total from all countries in the fiscal year 1930. Europe sent 147,438 immigrants during the year, Great Britain leading with 36,489, being followed by Germany with 26,569 and Italy with 22,327. The Irish Free State sent 17,971; Poland, 9,231; Czechoslovakia, 4,438; France, 3,713; Sweden, 3,109; the Netherlands, 2,738; Norway, 2,649; Greece, 2,291; Austria, 1,744, and Yugoslavia, 1,737.

Restrictive Effects.—A study of the following figures will show what a tremendous effect the present restrictive immigration laws have. In a single year prior to the World War, and, of course, prior to the first quota law, which was passed in 1921, immigration exceeded the million mark. A larger number of aliens arrived in a single year from each of several countries of Europe during that period than now come from the entire Continent. For example, in 1913 the then Russian Empire contributed 291,040 immigrants to this country; Italy sent 265,542, and former Austria-Hungary, 254,825. If comparison of these figures be made with the 147,438 alien immigrants admitted from all European countries in the fiscal year ended June 30, 1930, the drastic effect of American legislation will be partially appreciated.

CHINESE ALIENS

Admissions.—The number of Chinese admitted during the year was 8,114, of which number 970 were immigrants and 7,144 were non-immigrants. Of this latter, 4,770 were passing in transit and 420 were entering as temporary visitors. In the previous fiscal year 8,018 were admitted, 1,071 being immigrants and 6,947 being non-immigrants. It will be seen, therefore, that there was a slightly greater number of Chinese aliens who came to the United States during the past year than during the preceding year, but a smaller number who came to take up or resume permanent residence. Chinese numbering 9,542 departed during the past year as compared with 8,886 the previous year, the net decrease of alien Chinese residents being 1,428.

Citizenship Claims.—The main problem in connection with Chinese immigration had to do, not with alien Chinese, but with Chinese who claim American citizenship. While a considerable number of alleged citizens claiming birth in the United States apply for readmission, for the most part citizen applicants are those who claim to be citizens by reason of the birth of their alleged fathers in this country. There applied for admission during the fiscal year 3,220 Chinese who claimed citizenship as against 3,534 of this class who applied for admission during the fiscal year 1929. In order to determine the truth of the claims of these applicants, the immigration authorities are confronted with the difficult task of determining the relationship of an applicant to his alleged father when birth is said to have occurred in China. On June 13, 1930, there was approved an act to admit to the United States Chinese wives of American citizens where marriage occurred prior to May 26, 1924, the date when the last quota law was approved. As construed by the courts, the quota immigration act of 1924 prevented the permanent admission of the Chinese wife of an American citizen, but, by virtue of certain treaty rights, the Chinese wife of an alien Chinese merchant has been for many years held to be entitled to enter with or to follow to join her admitted husband. The remedial legislation referred to above corrects this anomalous state of affairs and within the limitations therein prescribed gives to the Chinese wife of an American citizen recognition in no way inferior to that enjoyed by the alien Chinese wife of an alien Chinese merchant. The legislation has been in effect so short a time that sufficient opportunity has not been afforded for the full enjoyment of its benefits. The equity of the legislation, however, is so obvious as hardly to seem debatable.

Smuggling.—The smuggling of Chinese over the border occurs infrequently except in southern California. In that locality smuggling has been rife during the past year owing largely to the unfavorable economic conditions in lower California. Many Chinese have entered surreptitiously and placed themselves in the hands of the authorities to be deported to China. This is a very unfortunate situation and one, it is hoped, ways and means may be found to prevent in the future.

DEPORTATION OF ALIENS

Deportees.—During the past fiscal year a total of 16,631 aliens were arrested and formally deported, as compared with 12,908 in the preceding year, and 11,625 for the fiscal year ended June 30, 1928. Of the past year's deportees, 4,502 were deported to Europe, 2,609 to Canada, 8,518 to Mexico, 458 to other countries of the Western Hemisphere, 461 to Asia, and 83 to Africa, Australia and the Pacific Islands.

Departure Classification.—In addition to the 16,631 aliens actually deported there were 11,387 subject to deportation who departed in order to avoid formal deportation. While the number of aliens removed under formal warrants of deportation in the year just closed exceeded that of the previous year by 3,723, the number of aliens disposed of was 10,778 less. That is to say, in the fiscal year 1929 the Immigration Service compelled the departure of 38,796 aliens. In the fiscal year 1930, however, only 28,018 aliens were got out of the country—16,631 being formally expelled under warrant of deportation, while only 156 shipped foreign one way, 370 paid their own passage, and 10,861 departed across the land border. Without doubt this condition was a result of the passage by Congress of the drastic first section of the Act of March 4, 1929, which provides that an alien expelled from the country, or ordered expelled, shall be forever excluded. Manifestly few aliens are disposed to depart voluntarily at their own expense, after being ordered deported, in view of the perpetual barrier against readmission erected by the statute. The cost of this to the Government is shown by the Commissioner General of Immigration to have been $312,660 in the fiscal year 1930. That is to say, by reason of the voluntary departure of 25,888 deportable aliens in 1929 there was a saving to the appropriation of $582,480; whereas in 1930, only 11,387 deportable aliens departing voluntarily, the appropriation was saved but $269,820.

Improper Visas.—Persons found in the United States without proper visa under the immigration act of 1924 make up the largest of all classes of deportees. In 1929 they numbered 6,874 and in 1930 their total was 6,694. The next largest class is that of persons who remained longer than permitted. These were 2,064 in 1929 and 2,019 in 1930. Of the 16,631 aliens expelled in 1930, 2,696 were illiterate.

Criminals.—During the year 763 aliens, convicted of crimes involving moral turpitude and sentenced to imprisonment of a year or more after entering the United States, were deported following release from prison. The largest number of deportees of this class (253, or 33.2 per cent) were Mexicans. The others included 94 Italian, 70 English, 45 French, 41 German, 39 Irish, 30 Spanish, and 191 of other races. In addition to the above, the deportees last year included 949 aliens who were criminals at the time of their entry. Here also Mexicans were the largest group (488 or 51.4 per cent). The others included English, 130; French, 86; Irish, 64; Scotch, 48; and 133 of other races. A number of these aliens had been previously deported, and all were subject to exclusion when they last entered the country. In the same period 44 aliens were deported because of conviction under the act approved May 26, 1922, commonly known as the Narcotic Act, embracing 22 Chinese, 5 Mexican, 4 Italian, and 13 of ten other races. Aliens of the immoral classes, including prostitutes after entry, procurers, persons coming for an immoral purpose, and the like, numbered 700, of whom 491, or 70.1 per cent, were Mexicans. The total deportees of the criminal and immoral classes for the past year was 2,456, the Mexicans alone numbering 1,232, or 50.2 per cent.

BORDER PROBLEMS

Arrests and Seizures.—The Immigration Border Patrol apprehended 22,448 persons of all kinds found engaged in unlawful or questionable activities. Of these 21,149 were turned over to examiners of the Immigration Service, of which 20,815 were smuggled aliens and 269 were found to be smugglers of aliens. There were turned over to the Customs Service 745 persons; to the Prohibition Unit, 63 persons; to state and municipal authorities, 416; and to other branches of the Government 75 persons. Seizures were made of 633 automobiles of an estimated value of $249,450, and of 173 other conveyances of an estimated value of $142,699. Liquor aggregating 229,099 quarts estimated at a value of $364,654, and miscellaneous contraband goods valued at $9,239, were seized by patrolmen and delivered to the appropriate governmental agencies concerned.

Border Patrol.—Each year since its establishment the Border Patrol has made tremendous strides in the development of its efficiency. The organization is recruited by means of competitive examinations from the finest type of young manhood. The work is arduous, exacting, and oftentimes hazardous, calling for the exercise of initiative, resourcefulness, discretion, courtesy and patience. Uncompromising honesty, intelligence, ambition, industry and courage are required. Fifteen members of the organization have lost their lives in encounters with outlaws since 1924, five in the past year.

LAW ADMINISTRATION

Provisions and Penalties. — On March 4, 1929, an act was approved providing for the punishment of aliens entering unlawfully. Section 1 made it a felony for an alien to enter or to attempt to enter 60 days after the enactment of the act if he had been previously arrested and deported in pursuance of law, and provided as a penalty imprisonment for not more than two years or a fine of not more than $1,000, or both. Section 2 of the act made it a misdemeanor for an alien after the passage of the act to enter at any time or place other than as designated by immigration officials or to elude examination or inspection, or obtain entry by wilfully false or misleading representations or by the the wilful concealment of a material fact. A penalty of imprisonment for not more than one year or by a fine of not more than $1,000, or both such fine and imprisonment, was provided. The act was subsequently amended to provide that it should not apply to an alien arrested and deported before March 4, 1929, in pursuance of law, in whose case prior to his reëmbarkation at a place outside the United States, or his application in foreign contiguous territory for admission to the United States, and prior to March 4, 1929, the Secretary of Labor had granted such alien permission to reapply for admission.

Prosecutions.—In view of the fact that the felony provision of the act was in effect less than two months in the fiscal year 1929 and the misdemeanor provision less than four months, satisfactory opportunity to observe its effects before the close of the fiscal year 1929 was not afforded. Nevertheless, 113 felony and 1,286 misdemeanor prosecutions were instituted. The outstanding feature of the activities of the service along such lines during the year was the institution of 679 felony prosecutions and 6,078 misdemeanor prosecutions under Sections 1 and 2, respectively, of the act referred to. While this act has not been in effect long enough to permit definite conclusions to be drawn as to its efficacy, it is believed that it will prove an effective deterrent and that, as knowledge of its existence becomes more widespread, violations will diminish.

Alien Seamen.—For many years the problem of preventing alien seamen from deserting their vessels and remaining here without compliance with the provisions of the immigration laws relating to applicants for admission has sorely perplexed the Bureau and its field officers. Shore leave and the right to search for another berth outward after being paid off or even following desertion cannot be questioned if the arriving seaman is a bona fide one in fact and physically fit. Sixty days are allowed for this purpose. All would be well if alien seamen would always go out after landing allegedly in pursuit of their calling, but we cannot keep such seamen under surveillance and we do not know, as a matter of fact, how many leave and how many remain. The situation has been rendered more acute in recent years by immigrants, barred from admission by the quota law, effecting entry as alleged seamen in pursuit of their calling. Some improvement in the situation, however, has been noted in the past year, brought about in part perhaps by the act of March 4, 1929, making it a misdemeanor for any alien to enter irregularly and a felony to enter or attempt to enter after arrest and deportation. In the case of a seaman, arrest and deportation now spell forfeiture of all future seaman landing privileges. During the past year there were 9,117 recorded desertions of alien seamen as compared with 11,314 in the fiscal year 1929, and 12,357 in the fiscal year 1928.

LEGISLATION

Family Considerations.—The hardships by reason of families separated when certain members left Europe for America are gradually being wiped out by reunion in the United States. Many cases have been automatically cared for by reaching them within the regular quota classes; and by preferences to certain members of American citizen families. May 29, 1928, an act was passed giving preference also to wives and minor children of legally resident aliens, and non-quota status to husbands of American citizens married prior to June 1, 1928. Two years' experience with this statute has demonstrated its practicability. Without increasing the gross migration from Europe it has eliminated the hardships attendant on the separation of thousands of families. Further, it has deferred the planting of new immigrant stock in the United States by encouraging the immigration of aliens in the direct line of family relationship and postponing the entry of collateral relatives and persons having no family ties here.

Selective Principle.—In his annual report the Secretary of Labor reviews the immigration problem and points out that our system of control, although effective as far as it goes, has not as yet reached that degree of perfection which the situation clearly demands. The quota limit plan, he says, is one of the important, if not the most important, milestone in the history of immigration to the United States, and experience in its administration affords a basis upon which to build an ideal system of immigration control. Calling attention to the fact that immigration from Europe has been reduced from an annual average of nearly 813,000 in the ten years of normal unrestricted immigration (1901-1910) to an average of 156,000 at the present time, he points out that our immigration laws are strong in some particulars and weak in others. Laws which discriminate against some friendly peoples, he says, ought to be changed. Laws which prevent expulsion of some undesirables ought to be made more strict. He recommends a selective immigration system (see annual report of Secretary of Labor).

Amendments. — The Commissioner General of Immigration has suggested twenty-two amendments to the laws, principally for administrative facility, but including also more liberality toward aged parents of citizens, stepchildren of American citizens, and political refugees, geniuses, etc.

THE QUOTA SYSTEM

By Harry E. Hull

Commissioner General of Immigration

THE IMMIGRATION MOVEMENT

Admissions.—In the fiscal year ended June 30, 1930, 446,214 aliens were admitted to the United States, as compared with 479,327 in the preceding fiscal year. Of the total admitted, 204,514 were of the non-immigrant class; that is, aliens who came for a short stay or were returning from a temporary visit abroad. During the same period 272,425 aliens departed from this country, making a net gain of 173,789 persons in the population of this country from immigration. This is a considerable reduction from that of the preceding fiscal year ended June 30, 1929, during which the net gain was 226,829. Undoubtedly the reduction is to be attributed to the satisfactory working of the present quota law; and in this connection it is interesting to note the net gain of 173,789 in the alien population as compared with the figure of approximately 650,000 aliens, representing the annual average addition to our population during the period from 1910 to 1914, when immigration reached its highest point.

Quota Immigrants.—In the past fiscal year 141,497 quota immigrants were admitted out of a total of 153,714 permitted to enter under the present quota plan based on national origin. This means that approximately 12,000 more quota immigrants could have been admitted. The preferences within the quota provided for by the Act of May 26, 1924, as amended and liberalized by the Joint Resolution of May 29, 1928, were taken advantage of by a large proportion of those admitted as quota immigrants. This legislation in substance provides that preference in the issuance of immigration visas shall be given to quota immigrants who are the fathers or mothers, or husbands by marriage occurring after May 31, 1928, of citizens of the United States who are 21 years of age or over; to quota immigrants who are skilled in agriculture, and the wives and the dependent children under the age of 18, of such immigrants skilled in agriculture; and to quota immigrants who are unmarried children under 21 years of age, or wives of alien residents of the United States who were lawfully admitted. It should be understood that the number of quota immigrants is not increased by the working of this particular provision of law; it simply means that among themselves as quota immigrants, preferences, as against other applicants for quota visas, are given to those specified in the statute. The purpose of the law is to enable immigrants subject to quota restrictions who have certain relatives in this country to proceed to the United States in advance of and in preference to quota immigrants not having such relatives here, thus hastening the reunion in this country of the members of families, as specified in the Act.

Nonquota Immigrants.—Under the present quota system, natives of Canada, Newfoundland, and of all independent countries in the North and South American Continents, as well as of adjacent islands, are exempt from numerical restrictions. In the past fiscal year 88,104 immigrants who gave countries in the Western Hemisphere as their last permanent place of residence were admitted to the United States. In addition, a large number of immigrants were admitted free from quota restrictions because of their relationship to citizens of this country.

Canada and Mexico.—In the fiscal year ended June 30, 1930, 63,502 immigrants, claiming Canada as their last permanent place of residence, and including quota and nonquota immigrants, were admitted as compared with 64,440 who were admitted during the fiscal year ended June 30, 1929, a total of 12,703 aliens of the same class were admitted from Mexico as compared with 40,154 for 1929.

Reëntry Permits.—The Immigration Act of May 26, 1924, provides that aliens lawfully admitted for permanent residence in the United States may be granted reëntry permits for the purpose of facilitating their reentry upon their return to this country after a temporary absence. A reëntry permit obviates the necessity of obtaining a non-quota immigration visa as a returning resident. Approximately 114,600 of these permits were granted during the past fiscal year, the greatest number since the law providing for their issuance was passed. It should be observed in this connection that neither a reëntry permit nor any other documentation is required of an alien resident of the United States possessing the qualifications requisite to the procurement of a permit if the alien desires only to visit foreign contiguous territory and certain nearby countries for a period not to exceed six months.

EXCLUSIONS

A total of 8,233 aliens were debarred in the fiscal year ended June 30, 1930, for various reasons defined by law, as compared with 18,127 in the preceding fiscal year. This is a sharp reduction in the number of debarments during the last year. Of the total of 8,233 debarred, 6,380 were refused admission at land border ports and 1,853 at seaports of entry. The system of according prospective immigrants in European countries a preliminary examination by officers of the Immigration Service eliminates a great number of aliens who would otherwise proceed to the United States only to be refused admission on their arrival. Aliens given this preliminary examination at American Consulates by technical advisors stationed in most European countries, in order to prevent as far as possible the embarkation for the United States in inadmissable aliens, are by this system saved considerable expense and the severe disappointment resulting from debarment.

CRIMINAL OFFENSES

Unlawful Entry.—In the fiscal year ended June 30, 1930, criminal charges were filed and convictions obtained in the cases of a large number of aliens who were apprehended in the act of attempting to enter the United States surreptitiously, or who were taken into custody after succeeding in effecting an illegal entry. Such convictions were in accordance with the terms of the Act of March 4, 1929, which provides that a surreptitious entry shall be deemed to be a misdemeanor, and that an alien found guilty thereunder may be punished by imprisonment of not more than one year or by a fine not exceeding $1,000 or by both imprisonment and fine, in the discretion of the presiding judge. The transcripts of testimony furnished in the case of the aliens against whom criminal charges were filed in connection with their illegal entries show that a large number of them were unaware of the fact that a law making a surreptitious entry into this country a criminal offense is in existence. When the fact that such a law is in effect receives greater publicity, it is believed that it will act as a salutory deterrent and will lessen the number of such illegal entries. Particularly will this be true as regards aliens who accomplish unlawful entries from contiguous territory.

Deportees Who Reënter.—The Act of March 4, 1929, also provides, in substance, that any alien who has been arrested and deported in pursuance of law, whether before or after the enactment of the Act, and in whose case prior to March 4, 1929, permission to reapply for entrance was not granted by the Secretary of Labor, shall be excluded, and that if such an alien enters or attempts to enter he shall be guilty of a felony and upon conviction thereof shall be punishable by fine or imprisonment or by both. When this provision of law also becomes better known it is believed that many aliens who fall under its inhibitions will be deterred from attempting entry into the United States.

ALIEN SEAMEN

Alien seamen continue to present a problem for the Immigration Service. An alien seamen arriving in a United States port may be given the privilege of shore leave and he may also be discharged from his vessel for the purpose of re-shipping foreign. The regulations provide that such shipment foreign must be effected within 60 days. In the event an alien seaman fails to re-ship within that period, or definitely abandons his status as a seaman, he can be taken into custody and deported. Prior to the passage of the Act of March 4, 1929, a large number of seamen previously deported for remaining longer than permitted, or on other grounds, reentered and continued to maintain unlawful residence in this country. A measure of relief from this situation was provided by the Act in that by its terms an alien subject to exclusion, who is employed on a vessel arriving in this country shall not be entitled to any of the landing privileges allowed by law to seamen, and to regulations made in pursuance of the statute provide that such an alien seaman must be detained on board his vessel while it is in port. However, despite all precautions, a considable number of seamen desert their vessels and continue to maintain unlawful residence in the United States.

CERTIFICATES OF REGISTRY

Figures covering the first year of the operation of the Act of March 2, 1929, in so far as it pertains to the Immigration Service, are now available. This Act in substance provides that a record of registry may be made of an alien in whose case no immigration record of arrival exists, who entered the United States prior to June 3, 1921, has resided in the United States continuously since such entry, is a person of good moral character, and is not subject to deportation. In the past fiscal year 18,800 applications for such registry were filed, of which 8,098 were granted, 1,125 were denied, 114 were withdrawn, and 9,463 were pending at the close of the fiscal year. Fees collected in connection with registration amounted to $161,960. The 8,098 aliens to whom certificates of registry have been granted are now in a position to apply for naturalization and to take advantage of other privileges accorded aliens having a legal domicile in the United States. It is believed that as the provisions of the law governing registrations become better known an increasing number of applications will be received.

LEGISLATION

Chinese Wives of American Citizens.—In the fiscal year ended June 30, 1930, there was only one Act passed by Congress having a direct bearing on the immigration situation, and that was the Act approved June 13, 1930, which in substance provided for the admission of certain Chinese wives of American citizens. Heretofore, by the provisions of Subdivision C of Section 13 of the Act of May 26, 1924, no aliens ineligible to citizenship, except certain classes named in such section, were admissible to the United States. The Chinese wives of American citizens, not being within the excepted classes, were thereby denied the right to come to this country. The Act passed on June 13, 1930, amended said section of the law so as to provide that the Chinese wife of an American citizen, who was married prior to May 26, 1924, may enter the United States as a nonquota alien, provided, of course, she is otherwise admissible under the immigration laws.

CITIZENSHIP AND NATURALIZATION

By Raymond F. Crist

Commissioner of Naturalization, Department of Labor

CITIZENSHIP

Status by Naturalization.—The fundamental authority for citizenship in the United States rests upon two provisions in the Constitution (see American Year Book, 1928). The status of citizenship by naturalization is a conditional one, both under the provisions of the Constitution and the statutes applicable thereto. It differs from the citizenship of the native in that presumption of expatriation may ensue upon an absence of two years from the United States with residence in the State of former allegiance or upon five years' absence in any other foreign State. Such presumption may be overcome by action under rules of the Department of State through diplomatic or consular officers of the United States. Again, fraud in the naturalization is presumed if the newly naturalized citizen shall establish a permanent foreign residence within five years of acquisition of American citizenship. Such a course is *prima facie* evidence of an act of sufficient gravity to justify the institution of a suit by the Government to set aside the citizenship as fraudulently acquired, since permanent residence within the United States is a condition precedent to naturalization. Citizenship will terminate, whether the individual be a native or naturalized, upon the taking of an oath of allegiance to any foreign sovereignty, notwithstanding that foreign citizenship shall not be vested consequent upon that act. Likewise expatriation follows acquisition of full foreign citizenship. While dual citizenship exists, one cannot claim citizenship in a country while demanding recognition as a citizen of another country.

Acquirement of Citizenship.—Citizenship has been quite uniformly conferred in the United States by the judicial process, and when so conferred the judicial proceeding is a case within the meaning of the Constitution, although the litigation is to determine a status and to grant or deny a favor and not adjudicate a right. Citizenship has, however, been collectively conferred by Congress upon large numbers through its treaty-making powers in the acquisition of territory, and upon the admission of portions of such acquired territory to statehood. Citizenship has also been conferred upon the inhabitants of acquired territory by legislative enactments in the absence of definite treaty stipulations and prior to admission to statehood. Native-born American Indians were admitted to citizenship through tribal treaties prior to 1871, and by the Act of June 2, 1924 (43 Stat. 253), all native Indians were given citizenship.

MACHINERY OF NATURALIZATION

Limitations. — Naturalization is not open to all races but is limited to those who come within the language of Section 2169 of the Revised Statutes of the United States. The limitations of this section are to aliens being free white persons and those of African nativity and to persons of African descent. Within such limitations the Act of June 29, 1906 (34 Stat. 596), as amended, and the Act of September 22, 1922 (42 Stat. 1021), as amended, confine their field of operation and constitute the major laws of the United States on the question of naturalization.

Canal Zone and Philippine Islands.—Naturalization is not conferred in the Philippine Islands, the Canal Zone, nor in any of the insular possessions except Porto Rico and the Virgin Islands. Citizenship in the Philippine Islands is conferred upon aliens resident in those islands under the Philippine naturalization law of 1920. Citizens of the Philippine Islands are not citizens of the United States but owe allegiance thereto.

Judicial Jurisdiction. — Congress has conferred jurisdiction to administer the naturalization law upon State Courts which have a seal and clerk and jurisdiction in actions at law or equity, or law and equity, in which the amount in controversy is unlimited. These State Courts are thereby made Federal agencies with jurisdiction coördinate with that of the District Courts of the United States. Courts of the Territories of Alaska and Hawaii of like territorial jurisdiction have been similarly empowered by Congress. In Porto Rico the United States District Court has had jurisdiction since March 2, 1917. The District Court of the Virgin Islands was clothed with similar jurisdiction Feb. 25, 1927, when Congress conferred United States citizenship upon certain inhabitants of the Virgin Islands and extended the naturalization laws to those islands. In the naturalization proceedings in all of these courts the United States is represented by appointees of the Secretary of Labor on the recommendation of the Commissioner of Naturalization.

Bureau of Naturalization.—Administration of the Acts of June 29, 1906, as amended, and of Sept. 22, 1922, as amended, and some minor acts, which comprise the entire naturalization in the Department of Labor. The Bureau accomplishes the administration of these laws through the field service with branches located in 38 cities throughout the United States, including Alaska, Hawaii, Porto Rico, and the Virgin Islands, subject to the direction of the Commissioner of Naturalization from administrative headquarters in Washington.

NATURALIZATION PROBLEMS

Alien Population.—The naturalization problem in this country is the largest and most complicated of any like problem in any other country and larger probably than in all other countries combined. This problem arises out of the millions of persons of foreign birth who have sought the opportunities which this country offers through its wonderful resources. The Census Report of 1920 is the latest available authority for the alien-born persons in the United States. At that time they numbered 13,920,692, including men, women, and children. The unnaturalized were shown to be 5,398,605. Not included in this total were 1,223,490 who had taken the first step towards citizenship and secured their "first papers". These two groups aggregated 6,622,095, or nearly one-half of the foreign born. Somewhat uncertainly connected with this problem were 805,509 individuals regarding whose citizenship status it was impossible to ascertain whether or not they had divested themselves of their foreign allegiance. Assembling these three groups together, the total of 7,427,604 leaves less than one-half of the total foreign population, or 6,493,088 who had acquired citizenship.

NATURALIZATION PROCEDURE

Process of Application.—Citizenship as ordinarily conferred upon persons of foreign birth is by judicial procedure. The first step in this proceeding is, however, ministerial, and consists in applying for a "certificate of arrival" to show the date, place, and manner of arrival in the United States of the intending applicant for citizenship. Such an application is made to the field naturalization office within whose territory the applicant resides. Accompanying this application must be the fee for the certificate of arrival and two photographs of the applicant. The certificate of arrival is issued upon the confirmation of the alleged arrival through examination of the immigration records for the port through which the alien was admitted into the United States. The admission must have been for permanent residence. Should there prove to be no record showing the arrival of the alien, he may, if arrival occurred prior to June 3, 1921, apply to the immigration authorities nearest his place of residence to have a record made of his entry and his status declared that of lawful admission for permanent residence.

Judicial Action.—The applicant then proceeds to secure from the clerk of the court within whose jurisdiction he resides the "first paper," or declaration of intention to become a citizen of the United States within seven years from the date of such declaration. This action occurs in any of the courts empowered to naturalize aliens within whose jurisdiction the alien may reside. The final step is filing the petition to the court for admission to citizenship and the hearing of the petition by the court. If granted citizenship by the court, the petitioner is required to abjure all allegiance by name to the sovereignity of which he is a citizen or subject and all others in general, and to take the oath of allegiance to the United States. A certificate of citizenship is issued to the new citizen and is popularly known as the "second paper." A photograph of the applicant is required to be affixed to the certificate of citizenship as well as to the "first paper."

Residential Requirements.—A person of foreign birth must have been admitted to the United States for permanent residence under the immigration laws in force at the time of his arrival in order to be eligible to take valid action towards the acquisition of American citizenship. Five years after such admission, if at that time the individual should be possessed of a declaration of intention made by him at least two years before, he may proceed to file his petition for naturalization. He must obtain from the Department of Labor a certificate showing the date, place, and manner of his arrival in the United States immediately prior to petitioning, for filing with the clerk of the court. If the certificate were obtained prior to the making of the declaration of intention, it will be available for use in petitioning. This certificate is issued from the record of the arrival made by the immigration authorities.

The petition for naturalization must be completed by two citizens of the United States who serve as subscribing witnesses and testify before the court as to the residence and good moral character of the petitioner during so much of the five-year period as they have known him immediately preceding the date of the petition. Only six months' residence within the county is required of the applicant to make him eligible to petition the court for admission to citizenship. Two witnesses ordinarily are required, but if, because of residence in two or more places in the county, two witnesses cannot be procured to testify to all of such county residence, other witnesses may be used by him to substantiate the remaining county residence. Residence outside of the county and good moral character may be established by depositions, which must be taken before naturalization examiners. No fee is charged for these depositions. A petition filed under the general provisions of the naturalization law may not be heard until after 90 days from the date it is filed. In addition to this, it must be posted publicly for a like period, with the date, as near as may be shown, for the hearing of the petition. Naturalization is prohibited during the 30 days preceding the holding of an election general to the jurisdiction of the court.

Exceptions.—There are some exceptions to these general provisions, which favor soldiers, sailors, enlisted men in the Navy and the Marine Corps, in whose behalf Congress has permitted the filing of petitions in any convenient court and to have them come on for summary hearing if the applicants have been examined by the Naturalization Service on behalf of the United States Government. By the act of March 4, 1929, Congress permitted aliens who had served in the American military forces during the World War to secure citizenship by naturalization on summary hearing before a naturalization examiner and the most convenient court, and without the payment of the usual naturalization fees.

Naturalization Fees.—The fees prescribed for naturalization are as follows: Certificate of arrival, $5; declaration of intention, $5; petition for citizenship, $10; certificate of repatriation, $1. Where there is no record and the alien arrived prior to June 3, 1921, the immigration authorities will make a record of the entry of such alien upon satisfactory evidence, for which a fee of $20 is payable to the Commissioner General of Immigration.

PETITIONS AND GRANTS

There have been 5,922,245 declarations of intention made by candidates for citizenship, and 3,013,897 certificates of naturalization granted upon the 3,429,697 petitions for naturalizatilon filed by applicants for citizenship since the Act of June 29, 1906 became operative, and up to and including June 30, 1930. During the year 1930, there were 62,138 declarations of intention made, of which 47,604 were by men and 14,534 by women of foreign birth. A total of 113,151 petitioned for admission to citizenship, included in which 83,794 petitions were made by men and 29,357 by women. There were 169,377 who received certificates of citizenship, and of these 120,572 were men and 48,805 were women.

The table which follows shows the nationalities of those admitted to citizenship during the year:

NATURALIZED PERSONS

(Fiscal Year, 1929–30)

Country		*Number*
Repatriated Americans		2,800
British Empire:		
Ireland	9,177	
England	7,223	
Canada	7,566	
Scotland	5,114	
Wales	390	
Australia	104	
Others	2,554	
Total British Empire	32,128	
Italy		31,551
Poland		22,596
Germany		15,762
Russia		12,994
Czechoslovakia		6,942
Sweden		4,848
Serbs, Croats and Slovenes		4,236
Greece		4,011
Rumania		3,932
Hungary		3,787
Austria		3,217
Norway		2,752
Lithuania		2,466
Turkey		2,335
Netherlands		1,696
Denmark		1,652
Switzerland		1,424
Finland		1,251
France		1,167
Portugal		800
Belgium		747
Syria and the Lebanon		717
Spain		635
Latvia		619
Albania		359
Esthonia		236
Bulgaria		213
Mexico		176
Palestine		152
Brazil		102
Free City of Danzig		100
Miscellaneous		634
Total		169,035

SPECIAL NATURALIZATION

Women.—Sept. 22, 1922, Congress passed a law which required women to become citizens independently of the action of their husbands. This law repealed the provisions of the laws by which the wife became a citizen upon the naturalization of her husband and by which she lost her citizenship upon marriage to an alien. Since Sept. 22, 1922, there have been 379,494 women who have made the declaration of intention to become citizens of the United States. There were 278,745 women who filed petitions for naturalization and 255,247 who have been admitted to citizenship.

Exemptions to World War Veterans.—The act of Congress of May 26, 1926, which gave exemptions to veterans of the United States military forces of the World War, expired May 25, 1928. Through the act of March 4, 1929, Congress renewed these exemptions. Under this Act 2,460 aliens acquired citizenship, which number added to those previously naturalized under similar exemptions brings the total to 300,506. This law expires March 3, 1931.

IMMIGRATION VISAS

The Immigration Act of 1924 requires each "immigrant" to obtain an immigration visa before departing for the United States for permanent residence. These visas are in the custody of the Bureau of Naturalization and constitute records to which reference is made to prove the claim of legal admission that will entitle an alien who arrived in the United States on or after July 1, 1924, to proceed to naturalization. There were 251,017 visas received in the Bureau of Naturalization in 1930, which added to those previously received made a total of 1,785,264.

CITIZENSHIP TRAINING

The Federal Textbook on Citizenship Training, prepared to provide a complete course of study for adults of foreign birth, leading from appropriate elementary lessons in English to a brief history of the United States with special reference to the form of government, and including practical lessons on citizenship in local communities, is furnished to candidates for naturalization who attend public school classes. Public school officials in 239 communities requested appropriate textbooks during the year 1930, the number furnished being as follows: Part I, Our Language, 13,278; Part II, Our Community, 9,372; Part III, Our Nation, 9,820.

NEW LEGISLATION

Readmission of Women.—July 3, 1930, Congress amended the Act of Sept. 22, 1922 permitting American women who are racially eligible to naturalization, and who lost citizenship through the conditions of marriage to aliens, to become citizens of the United States under a most simplified proceeding. All of the ordinary requirements of naturalization are waived. Upon appearing before a naturalization examiner and petitioning the court most convenient to the applicant, citizenship may be immediately conferred. If, however, the woman should happen to be an American-born Chinese, Japanese, Hindu, or other Asiatic not admissible to citizenship, she may not reacquire American citizenship. If her husband should belong to any of these races, though she may be of an eligible race, she may not reacquire American citizenship during the continuance of the marital status.

Repatriation.—The Act of June 21, 1930, authorized the issuance of certificates of repatriation to those Americans who lost their citizenship through taking an oath of allegiance to enter the military service, during the World War, of those countries who became associated with the United States in that war.

COGNATE SOCIETIES

GENERAL

American Colonization Society, 516 Colorado Bldg., Washington, D. C.

Cities Census Committee, 200 Fifth Ave., New York City.

Citizens' Committee of One Thousand, 100 Fifth Ave., New York City.

League of Foreign-Born Citizens, 342 Madison Ave., New York City.

National Liberal Immigration League, 128 Madison Ave., New York City.

Naturalization Aid League, 175 E. Broadway, New York City.

North American Civic League for Immigrants, 289 Fourth Ave., New York City.

Trade Union Immigration Bureau, 201 Second Ave., New York City.

RACES

Allied Citizens of America, Inc., 370 Seventh Ave., New York City.

American Ethnological Society, American Museum of Natural History, New York City.

American Indian Defence Assn., Inc., 221 W. 57th St., New York City.

American Indian League, 24 E. 74th St., New York City.

American Jewish Committee, 171 Madison Ave., New York City.

American Jewish Congress, 33 W. 42nd St., New York City.

American Scandinavian Foundation, 25 W. 45th St., New York City.

American Union of Roumanian Jews, 799 Broadway, New York City.

Association Generale Des Alasaciens-Lorrains d'Amerique, 46 W. 46th St., New York City.

Ancient Order of Hibernians, 937 W. 54th Place, Chicago, Ill.

Bavarian National Assn. of N. A., 758 Broadway, Buffalo, N. Y.

Centro Hispano-Americano, 353 W. 17th St., New York City.

Centro Vasco Americano Society, 48½ Cherry St., New York City.

English-Speaking Union of the U. S., 19 W. 44th St., New York City.

Federation De L'Alliance Francaise Aux Etats Unis et au Canada, 32 Nassau St., New York City.

Federation of Hungarian Jews in America, 799 Broadway, New York City.

Federation of Polish Hebrews of America, 32 Union Square, New York City.

Federation of Russian Polish Hebrews of America, 1824 Lexington Ave., New York City.
Foreign Language Publishers' Assn. of the U. S., Inc., 110 E. 42nd St., New York City.
France-America Society, Inc., 270 Madison Avenue, New York City.
General Netherlands Assn. Group of N. A., 179 S. Trenchard St., Yonkers, N. Y.
Hebrew Sheltering and Immigrant Aid Society of America, 425 Lafayette St., New York City.
Holland Society of N. Y., 90 West Street, New York City.
Huguenot Society of America, 2 W. 45th St., New York City.
Hungarian Society of N. Y., 1440 Broadway, New York City.
Indian Rights Assn., 995 Drexel Building, Philalelphia, Pa.
International Serbian Education Committee, 1049 Park Ave., New York City.
Japanese Assn., Inc., 1775 Broadway, New York City.
Jewish Congress Committee, 8 W. 40th St., New York City.
Jewish National Workers' Alliance of America, 189 Second Ave., New York City.
Lake Mohonk Indian Conference, Smiley, Mohonk Lake, N. Y.
Lithuanian Alliance of America, 307 W. 30th St., New York City.
Loyal Serb Society Srbadiya, 443 W. 22nd St., New York City.
Mexican Society of New York, 16 E. 23rd St., New York City.
National Assn. for Advancement of Colored People, 69 Fifth Ave., New York City.
National Federation of Ukrainian Jews of America, Inc., 505 E. 82nd St., New York City.
National Young Judea, 111 Fifth Ave., New York City.
Netherland American Foundation, 551 Fifth Ave., New York City.
Ordine Fieli D'Italia in America, 231 E. 14th St., New York City.
Polish Federation of New York City, Inc., 705 Courtlandt St., New York City.
Polish National Alliance, 180 Second Ave., New York City.
Russian National Society, 5 Columbus Circle, New York City.
Sons of Italy, 231 E. 14th St., New York City.
Thessalian Society, 667 Eighth Ave., New York City.
Ukrainian National Committee of the U. S., 30 E. 7th St., New York City.
United Roumanian Jews of America, Inc., 799 Broadway, New York City.
Universal Negro Improvement Assn. and African Commission League, 56 W. 135th St., New York City.
Young Men's Hebrew Assn., 31 W. 110th St., New York City.
Zionist Organization of America, 111 Fifth Ave., New York City.

DIVISION XV

SOCIAL PROBLEMS AND CONDITIONS

CRIME CONDITIONS AND TREATMENT

By Bennet Mead

Statistician, Federal Bureau of Prisons, Department of Justice

OFFENSES KNOWN TO POLICE

New Monthly Statistics.—An important step in the improvement of criminal statistics was taken during 1930. For the first time in the United States, comprehensive statistics of offenses known to the police are being compiled and published on a nation-wide basis. Official data on this subject have been published monthly, beginning Sept. 1, by the Bureau of Investigation, Department of Justice, under the title of "Uniform Crime Reports." The figures cover eight major offense groups: (1) murder and non-negligent manslaughter; (2) manslaughter by negligence (chiefly automobile accident cases); (3) rape; (4) robbery; (5) aggravated assault; (6) burglary—breaking or entering; (7) larceny or theft (except auto theft)—subdivided by amount, as $50 and over and under $50; (8) Auto theft.

Area Covered.—These statistics are based upon voluntary reports from local official police agencies. The monthly report for October includes reports covering 302 of the 368 cities with a population of 25,000 and over. These cities had a total population of about 37,000,000, or 76 per cent of the urban population in cities over 25,000. A promising start has also been made in the collection of crime data for the smaller cities and for rural areas.

Origin of Work.—This official collection of police statistics was authorized by a law passed in June, 1930. It was preceded by the unofficial collection of similar data beginning Jan. 1, 1930, by the Committe on Uniform Crime Records of the International Association of Chiefs o Police. This Committee had previously studied the problem of collecting adequate crime data, and ha formulated a complete standard system for the use of local agencies i recording and compiling crime statistics. It is planned, also, to compile annual statistics, beginning wit 1930, concerning major offenses whic are cleared by arrest, and concernin persons arrested for major offenses.

Significance of Data.—Eve though these newly developed polic statistics do not cover the entire are of the country, they provide a substantially accurate picture of th crime situation, and in time shoul also afford valuable data concernin crime trends. The data concernin the number and percentage of know offenses which are cleared by arrest if compiled as planned, will form more accurate measure of the degre of success attained by the police i dealing with serious crime, than ca be obtained through statistics of persons arrested.

Robberies and Burglaries.—In th 695 cities for which data were furnished for the first 9 months of 1930 there was a total of 27,600 reporte robberies, and 84,578 reported burglaries. The total numbers for the whol year may be estimated from thes figures to be about 37,000 robberie and 113,000 burglaries. (No list o these cities available, hence no com parison can be made on a population basis.) Of course, these figures do not tell the full story, since many other cities were not included. More satisfactory analyses and comparisons can be made in this field in the near future.

HOMICIDES

Number.—During the year 1929 there were approximately 10,200 homicides in the United States. This estimate is based upon the number reported for the death registration states, which covered 94.7 per cent of the country's total population in 1929. These figures include both criminal homicides and so-called justifiable homicides. The number of homicides, similarly estimated, was 10,500 in .1928, 10,000 in 1927, and 10,000 in 1926.

Death Rate.—The death rate from homicide in the entire death registration area in 1929 was 84 per 1,000,000 inhabitants. The homicide rate continues to be far in excess of the rates in other countries. No exact comparison can be made at this writing between the homicide death rate for 1929 and those for other recent years, owing to the fact that the death rates for previous years have not yet been revised according to the 1930 population census figures. The indications are, however, that the homicide death rate has decreased to some extent during the last few years.

Causes.—The chief factors in our large homicide death rate are the widespread use of firearms and our large Negro population. Firearms were the death-dealing agency for about two thirds of the homicide deaths in 1928, and the homicide death rate is 8 or 9 times as large for Negroes as for the white population.

Significance.—While homicide is the only crime for which comprehensive statistics have been available covering most of the country, it should be emphasized that most homicides are committed by occasional or accidental offenders, and not by habitual criminals, or from motives of gain. Consequently, any changes in the homicide death rate, while significant in reference to this one offense, throw little light on the changes which may have occurred in the general crime situation.

PRISONERS

Annual Census.—This canvass of the state and Federal prisons and reformatories has now been carried on for five years. Detailed data have thus far been published only for 1926 and 1927; while summary statistics are being compiled for 1928. Data for 1929 and 1930 are in process of collection and tabulation. It is of interest to consider some of the 1927 data concerning the penal treatment of offenders.

Prison Population.—On Jan. 1, 1928, the prisons and reformatories had a population of about 109,000 The population on Jan. 1, 1931, may be conservatively estimated as about 135,000. The ratio of prisoners per 100,000 inhabitants on this basis has increased from 74.7 on Jan. 1, 1910 to over 100 on Jan. 1, 1931. This growth has probably been due chiefly to a shifting of the task of penal treatment from local governmental units to the state and Federal governments.

Prisoners Received.—During the year 1927, about 53,000 sentenced prisoners were newly received from the courts into the state and Federal prisons and reformatories. The number received in 1930 is estimated at more than 60,000. During the twenty years from 1910 to 1930, the ratio of prisoners received, per 100,000 inhabitants, increased from 32.3 to over 50.

Offense Groups.—The long-time trend in the number of prisoners received from the courts has been steadily upward for most of the ten principal offense groups, as shown in the following table. It should be noted, however, that the ratios here given for 1923, 1926, and 1927 were computed before the 1930 population census results were available for making population estimates, and that revision on the basis of the 1930 figures would somewhat reduce these ratios. As to the meaning of the changes for various offense groups, it should be emphasized that while they show the changes in relative importance of the various offenses for the institutions covered, they do not show the trend in the frequency with which offenses are committed.

RATIO OF PRISONERS RECEIVED DURING THE YEAR

(Per Million Inhabitants by Offense:)
1910–1927 (a)

Offense	1910	1923	1926	1927
Larceny. etc. (b)	163	148	215	230
Burglary	125	111	134	140
Robbery	26	51	68	70
Forgery	34	45	50	56
Homicide	54	57	45	43
Assault	55	32	38	38
Rape	23	26	30	31
Other sex offenses	17	20	21	21
Liquor law violation	6	45	61	65
Drug law violation	(c)	35	33	31

(a) Data cover state and Federal prisons and reformatories in the United States.
(b) Including embezzlement, fraud, and having stolen property, as well as larceny so designated.
(c) Less than one per million.

Sentence.—The indeterminate sentence is being applied to an increasing majority of the offenders who are received into our prisons and reformatories. In 1927, in the institutions for which data are available, there were 137 received under indeterminate sentence for every 100 under definite sentences. The average length of the indeterminate sentences of male prisoners was 2.1 years for the minimum sentence, and 10 years for the maximum sentence. The average definite sentence was 4.6 years. Between 1923 and 1927 there was a decided decrease in the average definite sentence and the average minimum indeterminate sentence, but an increase in the average maximum indeterminate sentence.

Recidivism.—Among the prisoners received in 1927, recidivists (those previously imprisoned under sentence) made up 42.8 per cent of the total for whom information was available.

Seasonal Offense.—There are evidently marked seasonal changes in the frequency with which the principal offenses occur. The prisoners received in 1927 showed the highest frequency for January and the lowest for June. In general, the summer months were marked by low frequencies and the winter months by high frequencies. These seasonal trends were especially definite for robbery, burglary, and larceny, and were less regular for homicide, rape, assault, and forgery. It is of interest to note that similar seasonal trends are apparent in the monthly statistics of offenses known to the police, published by the Federal Bureau of Investigation.

Method of Discharge.—Prisoners who are discharged from prisons and reformatories are more often released on parole than on any other basis. In 1927, of the total reported discharges, 45.5 per cent were paroled, as against 38.8 per cent released upon expiration of sentence. The percentage released on parole declined from 53.9 in 1923 to 44.3 in 1926, but showed a noticeable increase from 1926 to 1927.

Time Served.—The average period of actual imprisonment (or time served) of the male prisoners discharged in 1927 was 2.2 years, while the average for females was 1.3 years. The average time served showed a decided increase from 1923 to 1927, for male prisoners, but the average for females showed no increase. For both sexes, the average time served was decidedly longer for those paroled or pardoned than for those released on expiration of sentence. On the average, the male prisoners discharged had served 25.6 per cent of their average maximum (or definite) sentences, and the females 30.4 per cent. For both sexes, the percentage of maximum sentence served was decidedly lower for those paroled than for those whose sentence had expired.

Federal Prisoners.—The Bureau of Prisons, Department of Justice, has begun during the past year the compilation of detailed statistics concerning Federal prisoners confined in non-Federal institutions. These statistics cover prisoners held for trial, as well as those under sentence. It is planned also to develop more complete and detailed statistics of persons paroled from the Federal institutions, and those placed on probation by the Federal Courts. The great expansion in the law enforcement activities of the Federal Government, which has largely occurred during the past decade, is reflected in the fact that over 50,000 persons were committed to local jails on Federal charges during the year ended June 30, 1930. More than 30,000 convicted persons were punished by imprisonment in local jails, while about 10,000 were committed to the Federal prisons and reformatories. On June 30, 1930, there were about 15,000 Federal prisoners in non-Federal institutions, as compared with 13,000 in the Federal institutions.

RESEARCH WORK

Judicial Administration.—An important development of the past year was the collection of detailed data from the Ohio courts, under joint auspices of the Ohio Judicial Council, the Ohio Institute, and the Johns Hopkins University Institute of Law. This intensive piece of research should help to establish standards for the continuous future compilation of adequate statistical court data. Similar intensive studies are being undertaken in Maryland and other states by the Johns Hopkins Institute of Law, in coöperation with various official agencies. The Harvard Institute of Criminal Law, the Yale Law School, and the Columbia University Law School, and other university groups are also conducting significant studies in the field of judicial statistics.

Presidential Commission on Law Observance and Enforcement.—This agency has conducted a number of important pieces of research. Chief of these was the exhaustive study by Professor Sam B. Warner of the Harvard Law School, of the present status of criminal statistics, especially those published by the states. A detailed statistical study of the Federal courts is also being made for the Commission under the direction of Dean Clark of the Yale Law School. A study of the handling of juvenile delinquents by Federal agencies is being made under direction of Dr. Miriam Van Waters of the Los Angeles Juvenile Court. A study of the economic aspects of crime is being made by Mary Van Kleeck of the Russell Sage Foundation.

Other Studies.—Significant case studies of the individual offender are being made by the Illinois Institute for Juvenile Research, the Judge Baker Foundation in Boston, and other agencies. The National Bureau of Social Hygiene has several important research projects under way, and a good start has been made toward the development of nation-wide probation statistics and juvenile court statistics, by the Federal Children's Bureau, Department of Labor.

PRISONS AND PENAL CONDITIONS

By Austin H. MacCormick

Assistant Director, U. S. Bureau of Prisons

GENERAL CONDITIONS

Improvement Measures.—The year 1930 has not been signalized by the major disturbances which occurred in several prisons during 1929. This is probably due in part to precautions taken by penal officials and in part to a general attempt to improve living conditions and the promise of further improvement in the near future. Since the disturbances of 1929 the public and official attitude has been that correctable conditions recognized as being among the underlying causes of the outbreaks should be rectified, and particularly that over-crowding and unemployment should be relieved. This attitude has been reflected in legislation. Building programs are being authorized throughout the country. Inmate populations are still increasing, however, and in some states the buildings projected will do no more than meet current needs.

Employment.—With the exception of an increase in construction work performed by inmates and a general tendency to expand farm and road work, there has been no substantial advance toward providing more employment for prisoners. Several states are contemplating changes in the industrial organization of their institutions to meet the restrictions on inter-state shipments of prison-made goods which will be enacted, it is assumed, when the Hawes-Cooper Act becomes effective in 1934.

Over-crowding.—In general, most penal institutions in America today are seriously over-crowded, a number having twice as many inmates as they were designed to house, and the problem of idleness has grown steadily more serious during the present year.

Disturbance Factors.—It is now recognized, moreover, that there are causes for the recent disturbances in addition to over-crowding and its accompanying evils: idleness, poor food, bad living conditions, mass treatment, etc. During the present year a comparatively dispassionate examination of the causes of the 1929 "riots" led to the conclusion that they were in many cases violent attempts to escape by a few desperate men rather than general riots. Loss of hope because of excessively long sentences, unwise legislation removing provisions for reduction of sentence for good conduct, and restrictions on a reasonable use of parole, are known to have been potent factors in stirring prisoners to revolt.

Penal Philosophy.—Another fact, that prisons have grown far beyond their proper size and that mass treatment alone is possible, is now being faced frankly. The lack of constructive agencies designed to promote the rehabilitation of the prisoner is also receiving attention. The penal philosophy of 1930 has become more constructive under the shocks of 1929, which followed the swing toward a purely punitive philosophy expressing our attitude toward crime in recent years.

American Prison Association's Congress.—At the annual Congress of the American Prison Association in October, a resolution setting forth many of the above facts was adopted. At the same time the forward-looking Declaration of Principles adopted by the 1870 Congress was reaffirmed with few revisions.

Public Attitude.—The significance of 1930 lies in the public attitude toward penal conditions and the general recognition of the need of change. On only a few phases of the problem and in only a few fields has that attitude had time to make itself felt.

OHIO PENITENTIARY FIRE

On April 21, 1930, occurred one of the most shocking disasters in penal history, when a fire in the Ohio penitentiary resulted in the death of 318 inmates. Severe rioting which followed the fire was finally quelled by state troops. Official and unofficial reports indicate that the loss of life was due to the incompetence and lack of training of officers as well as to the construction of the prison buildings. The penitentiary, which is a century old, is 100 per cent over-crowded and many of its buildings are fire-traps, but it appears certain that by prompt and intelligent action the loss of life could have been averted. The Ohio fire shocked the civilized world. Its effect was to cause many states to make a searching survey not only into their fire hazards but also into the whole penal problem. The tragedy has undoubtedly had the effect of expediting constructive legislation and administrative action.

THE FEDERAL PENAL PROGRAM

Bureau of Prisons.—Under legislation passed by the Seventy-first Congress early in the year, the federal penal service has made more significant advances during 1930 than ever before in its history. Under the leadership of Sanford Bates, the office of the Superintendent of Prisons has been reorganized as the Bureau of Prisons in the Department of Justice. Its personnel has been increased 200 per cent and experts in various fields have been added to the staff. An independent full-time parole board of three members and a supervisor of parole have been appointed. The number of probation officers in the various judicial districts has been increased from 8 to 44 and ten more are to be appointed during the present fiscal year. An expert supervisor of probation is attached to the Bureau.

New institutions of various types have been authorized and plans are being completed. They include a penitentiary in the north-eastern section of the country; a reformatory for men in the south-west; a hospital for the insane, tubercular and other chronic cases; and Federal jails at several strategic points where there is now heavy congestion. In the construction of the new reformatory for men at Chillicothe, O., substantial progress has been made during the year.

Medical Service.—The United States Disciplinary Barracks at Fort Leavenworth, Kan., loaned to the Bureau by the Army, has been used for the segregation of drug addicts and these prisoners have been removed from the penitentiaries. The site for the first of two narcotic farms to be operated under the U.S. Public Health Service has been selected. Under the new policy of the Bureau drug addicts are being treated primarily as medical cases. By authority of Congress the Public Health Service has assumed supervision of the medical service in all Federal penal and correctional institutions. Medical staffs have been greatly augmented, especially by the addition of full-time psychiatrists and psychologists, and new hospitals or additions have been completed in three institutions.

Industrial Measures.—The establishment of a working capital fund was authorized by Congress, with provisions for the establishment of diversified industries in all institutions. Farm projects have been expanded. To relieve both over-crowding and unemployment eight prison camps, for the most part doing road work in Army posts, have been established; over 1,000 prisoners are now in these camps.

Education.—A trained educational director has been appointed in each institution and librarians are to be appointed. A thorough program of academic and vocational education and library work is being promoted. An officers' training school for the Federal service has been established in New York City and 120 officers have been graduated during the year. An individualization unit of trained social workers is being established in each Federal institution.

Prison Population.—During the fiscal year ended June 30, 1930, the population of Federal penal and correctional institutions showed an increase of 22 per cent over the preceding year. Prohibition violators represented 50 per cent of those received during the year, in contrast to 25 per cent for the fiscal year 1929. During the year the larger institutions were strained to the limit, the population at Atlanta reaching 4100 at one time. Atlanta and Leavenworth are still 100 per cent over-crowded.

STATE PROGRAMS

New York.—On Aug. 1, Dr. Walter Thayer was appointed Commissioner of Correction to succeed Dr. Raymond Kieb. Following the report of a special commission, a parole board of three members was set up as a part of the executive department and an adequate administrative and field staff for parole was provided. A commission appointed by the Governor is now studying problems of segregation, new construction, and methods of providing employment Progress is being made on the new state prison at Attica, although the large expenditures proposed for the construction of this institution are now under examination. The new buildings at Sing Sing are now in use, but the old plant has not yet been abandoned. Following the fire of last year, extensive construction has been initiated at Auburn and the prison is practically being rebuilt. Proposals directed toward a modification of the Baumes laws, especially those relating to fourth offenders and to reduction of sentence for good behavior, are now under consideration.

New Jersey.—New Jersey is making rapid progress in solving the problem of the diversification of custodial care without the addition of a large number of institutions. Additional land has been added to the grounds of the State Prison at Trenton, which was badly cramped. The women prisoners have been removed from the prison to the reformatory at Clinton and a clearing house for women offenders has been established. Several hundred of the more promising prisoners have been transferred from the reformatory for men at Rahway to the new reformatory at Annandale, now under construction, and a corresponding number of younger inmates has been transferred from Trenton to Rahway, which is operated as a branch prison. The two major prison farms have been expanded. An institution for defective delinquents is now proposed to round out the institutional system. New Jersey has developed to a high degree a program of individual analysis and classification of prisoners.

PRISON CONSTRUCTION

Major Projects.—The wall and a number of cell units have been completed at the new Eastern Penitentiary of Pennsylvania at Graterford. The largest building project now under way, the Michigan State Prison at Jackson, is nearing completion. It is designed for a capacity of 6,000 prisoners and will cost about $8,000,000. Half of the cells are the inside type and half a modified outside type. At Joliet a 1,000-man cellhouse is under construction. The
circular cell-house plan has bee
abandoned for the standard rectangu
lar type. At Auburn (N. Y.
additional land has been acquired an
new fire-proof buildings are replacin
the old. A modern 610-cell wing i
under construction and the tota
capacity of the new cell houses co
templated to replace the old will b
1500. Segregation sections with in
dependent feeding facilities have bee
established. At the new Massachusett
Farm Colony at Norfolk, the wall an
the first of the eight dormitory build
ings have been completed.

Other Construction.—Many othe
institutions are making substantia
additions to their plants. The Rock
view Prison (Pa.) has a new uni
of 256 outside cells under roof an
will complete it by March 1st. Th
Western Penitentiary of Pennsylvani
is building a new mess hall, kitche
etc. At Great Meadow (N. Y.) ne
construction includes a chapel an
assembly hall. In the Tennessee Pri
on a building for women prisoner
removed from the main prison, ha
been completed and occupied. Th
Virginia Penitentiary is fire-proofin
all its buildings. The Mississip
Prison Farm has enlarged and mo
ernized its hospital and has improve
conditions in the living quarters. Th
Wisconsin Prison has a building f
the sheet metal industry under co
struction. Folsom (Cal.) is buildi
a cell house of 310 cells, a new a
ministration building and a new ho
pital. The Indiana Reformatory f
men is constructing a dormitory ou
side the walls and the Washingt
State Reformatory is completing
new Domestic Building. At the Il
nois Reformatory for Men a cell hou
of 1000 cells is being completed. A
the Connecticut Reformatory f
Women a number of new buildin
have been completed and the capaci
increased by eighty. Women priso
ers have been transferred there fro
the State Prison.

NEW INSTITUTIONS

An Intermediate Reformatory f
Men has been established in Missou
eight miles from the State Prison.
site for the new Maryland Penite

tiary has been selected at Roxbury. The Illinois Reformatory for Women at Dwight has opened during the year with eight cottages and other buildings on a plot of 160 acres. The site has been selected for a new institution in California to replace the women's section of San Quentin Prison. The contract for the $10,000,000 county penitentiary at Riker's Island (N. Y.) is about to be left as the year ends.

EDUCATION

Official Personnel Training.—Following the lead of the New York City Department of Correction and the Federal authorities, a number of states are making plans to establish training schools for institution officers. Among them are New York, New Jersey and Maryland. The heads and deputies of the two new Federal institutions will be selected by a special type of Civil Service examination for the first time in the history of the Federal service. The growing recognition of the need of more carefully selected, better paid, and more scientifically trained officials is one of the most encouraging features of the year's progress.

Educational Directors.—The year 1930 has been marked by increased interest in education and library work. At the Prison Congress a committee on education was added to the list of permanent committees of the American Prison Association. A Prison library exhibit was a feature of the Congress. Trained educational directors have been appointed during the year at Jackson and Joliet, as well as in the Federal institutions. Ten prisons now have trained full-time directors and half that number have trained directors on a part-time basis.

Educational Status.—Educational work, however, is still at a very low ebb in prisons. In reformatories for men and women it is more extensive and generally more effective than in the prisons, but in men's reformatories it tends toward stereotyped routine and in women's institutions toward haphazard, indirect instruction rather than well-organized training. No prison has a real program of vocational training; this type of education is stressed in reformatories for men and women with varying success.

Libraries in penal institutions are more effective agencies of recreation than of education; few have well-rounded collections of books, the lack of up-to-date non-fiction being marked. There is only one librarian with library-school training in all the penal institutions of the country; he is at the U. S. Industrial Reformatory at Chillicothe.

Individualization.—In theory, the present tendency is toward individualization and classification and away from mass treatment. In practice, the latter is forced on most institutions by excess populations and insufficient trained personnel. In the Federal institutions and those of a few states, notably Illinois, Maryland, Massachusetts, New Jersey, New York and Pennsylvania, an effort is being made to individualize treatment through diagnoses by psychiatrists, psychologists and social workers.

Other Enterprises.—Among the constructive enterprises noted during the year, in addition to those already cited, are the following: the emphasis on community life at the Massachusetts Farm Colony; the study of individual prisoners by sociologists from the Rockefeller Foundation at the Massachusetts Prison; the expansion of education at the Maryland Penitentiary under graduate students from Johns Hopkins University; the reorganization of education work in the Illinois institution; the expansion of education at the Kansas Industrial Reformatory; the extension of university correspondence courses and State Library Commission reading courses at the Wisconsin Prison; the excellent work done at Jackson by Michigan State Library representatives; and the assumption of responsibility for the educational program at the New Hampshire Prison by the State Department of Education.

PREVENTIVE WORK IN DELINQUENCY

By Douglas P. Falconer

Executive Secretary, Children's Aid Society, Buffalo

CRIME PREVENTION

New York.—On Jan. 16, 1930, the New York City Police Department began an interesting experiment in preventive work, with a budget of approximately $100,000. The Bureau begins auspiciously with a staff of 25 well-trained case workers, 35 patrol women, 25 patrol men, 8 sergeants, 50 welfare lieutenants, and one deputy inspector, all carefully selected because of their aptitude for this work. The fear of political interference has been ended with the appointment as director of Henrietta Additon, experienced worker in this field and most recently with the staff of the American Social Hygiene Association. The Bureau aims to "supplement the work of existing public and private agencies in the field of crime prevention, and to lend official support to strengthen and extend the activities of these associations." In the first six months, it had referred to it 2,653 situations involving children and young people likely to become delinquent. The Bureau also deals with local situations which contribute to juvenile delinquency, and, in this connection, supervises pool rooms, dance halls, and other forms of commercialized amusement. The future possibilities are great, not the least of which may be the gradual changing of the reliance of the Police Department upon the force of the law and a corresponding modification of the attitude of fear and hostility, held by youth, toward the Police Department.

Berkeley, Calif.—In Berkeley, the Police Department, under the leadership of August Vollmer, has formed a Coördinating Council whose membership includes the Assistant Superintendent of Schools, the Chief of Police, the City Health Officer, the Visiting Teacher, the Police Women, the Boy Scout Executive, the Director of Elementary Education, and representatives of the Welfare Society and the Charity Commission. Meeting weekly, they consider the problems of difficult children, and make plans for a more closely knit and effective service. To aid in this they have established a behavior clinic and have won the enthusiastic cooperation of parents in its use. All efforts to help children are considered and appraised by the Council. Such team work and the honest facing of weaknesses in their own programs are most encouraging.

Massachusetts.—The appointment of Dr. A. Warren Stearns, a psychiatrist, to be Commissioner of the Department of Corrections of Massachusetts, marks an interesting forward step. Dr. Stearns' immediate program involves the establishment of trained personnel divisions in each of the penal institutions, so that adequate case histories of each inmate may be made. He is also working for the establishment of central clearing houses from which criminals and minor offenders would be assigned to specialized institutions, according to their ability to respond to corrective treatment. Dr. Stearns feels that the staff of a prison should be analogous to the staff of a hospital and should include a generous number of physicians, psychiatrists and social workers who would study and diagnose each prisoner individually. Also in Massachusetts, Commissioner of Public Safety, Alfred F. Foote, has added police women to the police constabulary.

COMMISSIONS AND CLINICS

Wisconsin.—The Children's Code Committee of the Wisconsin Conference of Social Work has made some progress this year. The outstanding development is the organization of eleven county children's boards. These boards are in rural counties where no social agency of any kind exists. The Juvenile Department of the State Board of Control has undertaken the education of these lay boards along child welfare lines, and it is expected that they will do a good deal in the field of juvenile protection. The Wisconsin Conference of Social Work has organized this year a state wide Committee on Crime and Criminal Justice.

New York.—The Crime Commission of New York State has published a valuable report, "Crime and the Community, a Study of Trends in Crime Prevention", by the Sub-commission on Causes and Effects of Crime. This report was based on a series of case studies of the life careers of young juvenile delinquents. In addition to concluding that there are no unit causes of crime, this Commission believes that the ultimate crime prevention task is that of guiding the development of childhood behavior. That task is one neither for national nor state effort, but for county or municipal direction. The work unit under a county or municipal crime prevention program must be large enough to include the life of a social group or economic class and small enough to deal with the forces which are primary in character formation. That unit is the neighborhood. The Commission goes into some detail in a series of recommendations concerning the way a community should organize itself to reduce its problem of juvenile delinquency.

Detroit.—The Couzens Fund for Child Welfare in Michigan is financing a clinical study of special aspects of the problem of delinquency, to be undertaken in Detroit under the direction of Dr. L. A. Schwartz, psychiatrist. The study will be integrated with a part of the research program of the Yale Institute of Human Relations, conducted by Dr. William Healy and Dr. Augusta Bronner. It will concern itself largely with a comparison of the home and family factors underlying juvenile delinquency and maladjustment in Detroit, with those found through similar studies in Boston and New Haven. Case material will come from the Detroit Juvenile Court and will be studied from the point of view of mental hygiene.

Cleveland.—The Cleveland Juvenile Court has a full time psychiatric service under the direction of a member of the staff of the Cleveland Child Guidance Clinic. A department of Psychiatric Social Work has been established at the School of Applied Social Sciences of Western Reserve University, the teaching personnel being supplied by the Child Guidance Clinic.

Maine.—The Federal Children's Bureau has made a survey of juvenile delinquency, including a study of the methods of dealing with juvenile offenses and an analysis of community resources, in a series of detailed case studies to illustrate the different types of actual care given to a representative group of children. These cases had been dealt with unofficially or had come before the court. A valuable series of recommendations is included in the report.

The mental hygiene movement is making rapid progress. The Child Guidance Clinic of Niagara Falls has been established under fine auspices; a clinic has been organized in Portland, Ore., and a great number of others are being developed all over the country. Further information can be secured from the National Mental Hygiene Committee.

REPORTING OF STATISTICS BY JUVENILE COURTS

The Federal Children's Bureau is making substantial progress in persuading various juvenile courts to submit uniform statistics. Over a hundred such courts were reporting such material in 1930. This important data is rapidly getting to be on a nation-wide basis and will, for the first time give us some actual information concerning the extent and types of juvenile delinquency. As these statistics are available and analyzed, the necessity for further studies in various localities is becoming apparent, and the Federal Children's Bureau is seeking to obtain additional staff to make such studies.

WHITE HOUSE CONFERENCE

Most important, however, for the year 1930, is the White House Conference on Child Health and Protection which met in Washington, Nov. 19-22, 1930. Over a year ago President Hoover appointed a series of committees to study the problems of child health and protection in this country and to present the data to the American public. The committees were also to prepare recommendations as to the next steps to be taken. The Conference has amassed a tremendous amount of data which will be of great value to all child welfare groups, including those who are concerned with the reduction of delinquency. Some time during 1931 their conclusions, as well as the data, will be available in published form. The summary of the conclusions of the committee dealing with delinquency runs as follows:

"On the basis of the best available statistics, about 200,000 different delinquent children were in 1928 dealt with by various courts of this country, about one per cent of the children of juvenile court age. This is but a fraction of all delinquents as a great many are handled by the police and other agencies without recourse to the courts. Because of its extent and of its relationship to adult delinquency, the problem of juvenile delinquency becomes of immense importance and in fact the so-called 'problem child' actually becomes the 'problems of the child.'

"Valuable as was the inculcation of our fathers of the habits of regularity, honesty and courage, experience shows that this was not enough. It becomes necessary to grapple at closer range with those conceptions of human life that are basic in the child as a growing organism. Our law has so busied itself with property that the fundamental principles of human life and conduct have not had careful analysis. Our attention must be focused on the delinquent rather than the delinquencies. We have neglected to give consideration to the basic personal needs of the child and to the way in which these needs have clashed naturally with the requirements of the group in which he must find his place as a socialized being in spite of his hungers and 'the drives' that influence him.

"In times past we heard much of delinquency and crime as being the result of inborn general physical conditions and of the inheritance of delinquent or criminal tendencies. These concepts are no longer accepted. We must not forget that physical and mental defects, disease and peculiarities have an important bearing upon the incidence of misconduct. There are, however, many additional factors. The much larger portion of the difficulties are of the natural sequences of the stresses involved in every child's attempt to fulfill his own needs in his adjustment to the social groups in which he must live. The child's emotional life, his family traditions, his family's economic and social needs, the satisfactions or lack of satisfactions of the school, the influence or failure of influence of the Church, the effect of early fatigue of industry, and the child's maladjustment to it, all play important parts in his development toward or away from delinquent tendencies.

"This view naturally places much responsibility upon the adult members of society. It emphasizes the importance of the example of adults' lives. It sees the child as ever gathering and weaving into his life the standards by which he must live as a person having responsibilities. It demands that the adults of the family, the school, the courts and police, the Church, industry and all community agencies interest themselves in the problem as to what they mean to each child in terms of answering his natural and proper needs and cravings. It is only as these varied social groups actually join in a great cooperative enterprise, only as we sense and build with their needs, longings and visions, can the delinquent be understood and his needs met—thereby strengthening his social living. When we come to recognize that all legally constituted authority has the duty to the child to aid and to educate and not to punish him, we shall have taken the longest step in the direction of the child's protection and prevention of delinquency."

SOCIALISM

BY NATHAN FINE

THE RAND SCHOOL OF SOCIAL SCIENCE

SOCIALIST AND COMMUNIST BODIES

Although both claim as their goals the establishment of Socialism, the Socialist and the Communist movements are to be very sharply differentiated. They are uncompromisingly opposed to each other in the United States, as in all other countries.

The Socialist Party, together with those trade unions, coöperatives, and other organizations—such as the Workmen's Circle—which are closely allied with it, as well as the much smaller parent body, the Socialist Labor Party, constitute the Socialist movement of America.

The Communist Party, formerly known as the Workers' Party, affiliated with the Communist International, together with its numerous auxiliaries, and the three other smaller Communist factions, the Communist Party (Majority Group)—led by Jay Lovestone—, the Communist League (Opposition) headed up by James P. Cannon—, and the Proletarian Party, constitute the organized Communist movement of the United States.

SOCIALIST LABOR PARTY

The May 3, 1930, issue of the *Weekly People*, official English organ of the Socialist Labor Party and edited by Olive M. Johnson, appeared in a much enlarged size, to celebrate the 40th anniversary of the revival of the party, which was originally launched in 1877 but was given additional momentum by the adhesion of Daniel DeLeon in 1890. The leaders and surviving pioneers contributed historical and analytical articles. About two months later, July 5, Henry Kuhn, one of the outstanding leaders, who was closely associated with Daniel DeLeon, passed away at his home in Richmond Hill, New York.

Besides its English weekly, the Socialist Labor Party continued to issue four foreign language publications, in Hungarian, South Slavonian, Bulgarian, and Greek. It entered the Congressional and state campaigns of 1930, with a characteristic platform calling solely for the abolition of capitalism.

In 1928 its candidate for President, Verne L. Reynolds, was credited with 21,181 votes in 18 states where he was on the ballot. In 1930, however, the gubernatorial nominee in New York State received 9,096 votes, as against 4,211 for the presidential candidate two years previously; the candidate for governor in Massachusetts in 1930 as many as 14,603, against only 773 for Reynolds in 1928; and in Maryland, in 1930, for governor, 1,358, contrasted with 906 for President in 1928. These are the only returns so far in. The Socialist Labor Party carried on considerable agitation through its national and local lecturers and organizers. Arnold Petersen continued as national secretary.

SOCIALIST PARTY

The Socialist Party was formed in 1901, by a secession movement from the Socialist Labor Party—guided by Morris Hillquit, at present national chairman,—uniting with the newly organized Social Democratic Party, led by Eugene V. Debs and Victor L. Berger, both deceased.

In March, 1930, Clarence Senior, national secretary, reported a minimum membership of 10,627. He declared that the dues systems in various states made it impossible to give the exact membership. In 1928 the Socialist Party received 267,835 votes for Norman Thomas, its candidate for president, in 42 states where he was on the ballot. Returns are not at hand concerning the total for the 1930 election. Gains were registered in New York State, Wisconsin, California, and parts of Pennsylvania.

REVIVAL OF SYMPATHETIC UNIONS

To the October, 1930, convention of the American Federation of Labor, the International Ladies' Garment Workers' Union reported a membership of 50,800, as against 32,300 in 1929 and 30,300 for 1928. Similarly, the International Fur Workers' Union reported 7,000 members, contrasted with 2,800 in 1929, and 4,200 in 1928. These needle trades unions had been completely under the influence of left wingers and Communists, who, when they were overthrown, organized the Needle Trades Workers' Industrial Union in July, 1928, affiliated with the Trade Union Unity League and the Red International of Labor Union. The world depression in general and in the industry in particular has hit the needle trades unions very hard. That they were able to make some gains in membership notwithstanding indicates considerable vitality.

MILWAUKEE AND READING

When the Wisconsin Socialist Party convention met to nominate State candidates in May, there were present four Socialist mayors: Daniel Hoan of Milwaukee, Rae Weaver of Beaver Dam, Martin Gorgensen of Manitowoc, and R. I. Anderson of Iola. In the November elections the Milwaukee Socialists increased their delegation in the lower legislative house from three to nine, while retaining their two State Senators. They also elected a sheriff. They failed of returning a Congressman from Berger's old bailiwick, the 5th district, by some hundreds of votes. Toward the close of the year they took steps to put the *Milwaukee Leader*, their daily, on a sound financial basis by launching the Victor L. Berger Foundation, with Marx Lewis in charge. The executive board of the Socialist Party of Milwaukee condemned the behavior of the city's police chief toward the Communists in their demonstration of March 6th.

The Socialists of Reading had obtained control of all five posts in the city council in 1927 and 1929. They added to their gains by sending two members to the State legislature in 1930. At a January, 1930, meeting of the School Board, where the Socialists do not have a majority, the following resolution was lost by one vote:

"Resolved, That for the future it shall be the policy of this Board not only to foster courses and exercises which will advance the cause of peace and international good-will, but also that no military demonstration or exercises be held either as a part of or in conjunction with any school function."

NEW YORK

Spurred on by the remarkable vote received by Norman Thomas for Mayor of New York City in the November, 1929, election, the Socialist Party of the metropolis threw itself into practically every important fight being waged in city and state. Representatives appeared before the Board of Estimate and Apportionment on several occasions on the subjects of the budget, housing, transit, and unemployment. They traveled to Albany to plead for a system of adequate old-age pensions and for proportional representation. Norman Thomas was called before the Grand Jury investigating the Magistrates' Courts.

On the vital problem of unemployment letters and telegrams were sent Governor Franklin D. Roosevelt. A kitchen to feed the hungry jobless was opened by the Women's Section of the party. An emergency Conference on Unemployment was organized, with 585 delegates present. The Conference program called for maximum speed in the letting of public contracts, slum clearance with municipal housing, adequate employment offices, and immediate relief through the distribution of food and clothing and the payment of rent. The State platform of the party, besides emphasizing the need for extensive works and a system of employment offices called for the 6-hour day and 5-day week, ratification of the child labor amendment, an old-age pension at 60 and compensation on discharge. A sub-committee of the National Executive Committee drafted a model unemployment insurance bill to be introduced in the various state legislatures, with premiums equal in amount from employers and the state treasury, to be raised by taxation on the higher incomes and from inheritances, and adequate benefits for the unemployed as long as they were unable to find work.

In the November, 1930, elections the New York Socialists put up an all-star cast for Congress: Heywood Broun, a new convert, in a district which included Park and Fifth Avenues; Norman Thomas in a Brooklyn district, thus setting an American precedent by running him in a different borough and district than the one in which he voted and lived; B. Charney Vladeck, the manager of the largest foreign language newspaper in the country, the *Jewish Daily Forward;* Jacob Panken, the former City Court Judge; Samuel Orr, the ex-Assemblyman; and A. I. Shiplacoff, former manager of several of the needle trades unions. These candidates waged spirited campaigns, their committees spent thousands of dollars, secured the support of non-Socialists, and received the endorsement of many metropolitan dailies. They were encouraged by the moral and financial aid of the League for Independent Political Action, organized to assist in the formation of a third party and headed up by John Dewey, the educator and philosopher, and Howard Y. Williams, of the successful Minnesota Farmer-Labor Party. They increased their vote over previous Socialist candidates, but were not able to break into Congress. Louis Waldman, candidate for Governor, obtained 120,444 votes in the State, compared with 101,859 in 1928.

NATIONAL

The leaders of the party, Morris Hillquit, Norman Thomas, James Maurer, Daniel Hoan, James Oneal, Clarence Senior, and others made an extended tour across the country in connection with the meeting of the executive committee in March. They held over a hundred meetings. They found a vigorous and growing movement in Los Angeles, their meeting place, a result largely of the efforts of William W. Busick, Stanley Rogers, and the group of young people newly attracted to the party. Upton Sinclair, running for Governor of California, made a good showing compared with recent previous elections.

An unsuccessful effort was made throughout the year to move the headquarters of the party from Chicago to Washington, D. C. Meetings were energetically pushed, calling for the release of Thomas J. Mooney and Warren K. Billings. Agitation was conducted to prevent the confirmation of John J. Parker to the U. S. Supreme Court. Considerable discussion developed within the party on India and Soviet Russia. No official position was taken with reference to the acts of the British Labor Party. The Relief Society for Socialist Prisoners and Exiles in Soviet Russia was encouraged, coupled with a demand for the recognition by the United States government of the Soviet Union. Any embargo on Russian imports was condemned.

MILITANTS

At conventions of the New York Socialist Party, as well as at private conferences, a group program was advanced by some younger members of the Socialist Party, who came to be known as the "Militants." As given in the *New Leader* of April 19, 1930, they demanded at that time a Socialist movement with (1) its face toward the workers; (2) fighting capitalism; (3) with more mass propaganda; (4) with a policy to win the youth; (5) trying to bring in the Negro worker; (6) more determinedly building the party press; (7) encouraging a definitive labor or Socialist culture; (8) making education and the educated comrades serve the movement and putting research to work; and (9) helping the cooperatives. The theoretical base and practical program had not in 1930 been thoroughly hammered out, but will no doubt be worked out and presented to the national party conference May 29-30, 1931, decided on by the national executive committee. The outstanding spokesman of the Militants, Louis Stanley, has stressed the importance of the party conducting work in the unions, developing and fitting in the immediate demands to the ultimate Socialist goal, and always building an international Socialist cultural outlook.

FOREIGN VISITORS AND PERSONNEL

A number of distinguished foreign Socialists visited the United States during the year, including Robert Danneberg of Vienna, Raphael Abramovitch and Victor Chernow of the Russian Socialist groups and Fenner Brockway, Rennie Smith, Jessie Stephen and George Dallas of the British movement.

Three prominent pioneers were feted on their 70th birthdays. Abraham Cahan, still vigorous, and Benjamin Feigenbaum were hailed for their great services to the *Jewish Daily Forward* and the labor and Socialist movement. Mr. Cahan received greetings from Socialist and labor leaders throughout the world. William Adams, Greenbacker, Populist, Socialist Laborite, and Socialist Party member, was banqueted by his Pittsburgh comrades.

The American Socialist movement was the poorer through the deaths of Harry C. Parker, the manager of the "Red Special" which toured Debs in 1908; Louis Gardy, cartoonist, reporter, city editor and dramatic critic of the *New York Call* from 1908 to 1921; Mrs. Mary Quinlan Laughlin, poet and author, and Irving M. Weiss, attorney, both of Buffalo; and Mrs. Fannie Bixby Spencer, pacifist, libertarian and Socialist of California.

HOUSING PROBLEMS

By George Gove

Secretary, New York State Board of Housing

CALIFORNIA HOUSING AID FOR VETERANS

Additional Appropriation.—Public attention during the past year has been directed largely towards devising new methods to promote home ownership, slum clearance, and plans for erecting model dwellings for wage earners. Toward the encouragement of home ownership, outstanding legislation was the appropriation by the California legislature of another $20,000,000 to be expended under the terms of the California Veterans' Welfare Act. Under this law, war veterans and their families are aided in the purchase of homes or farms in that state. By the bond issue approved at the general election in November, the total amount appropriated by the California legislature for that purpose was increased to $50,000,000, $10,000,000 having been originally appropriated in 1922 and $20,000,000 in 1926. The earlier appropriations have provided homes and farms for nearly 7,500 ex-service men in the past eight years. This has been done without one dollar of loss or one cent of cost to the taxpayers.

Operation and Procedure.—Under the California plan, veterans apply to the Veterans' Welfare Board which, after careful scrutiny and appraisal, buys the property for cash and sells it to the veteran who makes an initial payment of 5 per cent, paying the balance in monthly instalments in twenty years with interest on the loan at 5 per cent. These payments are sufficient to meet the interest requirements, to retire the bonds when they mature and to pay all expenses of administration. The plan avoids the constitutional prohibition against lending the credit of the state by providing for direct purchase by the state and re-sale to the veteran. The maximum loan to an individual veteran is $5,000, which may be applied to the purchase of a farm or home not exceeding $7,500 in cost. The careful supervision of plans, building materials, cost, workmanship and location by the Veterans' Welfare Board serves to protect the state in its investment and gives highly valuable protection to the veterans in their purchases.

NEW YORK HOUSING LAW

Provisions.—The California experience is unique in this country. Except for the short-lived Dakota experiment, no other state has attempted to use public funds for housing purposes. The only other state to enact housing legislation of a similar character is New York. However, the New York State Housing Law differs from the California act both in purpose and in method. Whereas the California act makes no provision for reducing the cost of housing but is directed exclusively toward the encouragement of home ownership, the New York State Housing Law seeks to reduce housing costs and to make available to wage earners model homes at rents which they can afford to pay. The New York law does not make use of public funds or of public credit, but invites private enterprises into partnership with the state and with the municipality to provide adequate housing at low rents without direct subsidy and without philanthropy.

New York City Projects.—Under this plan, seven large multi-family housing projects have been erected in the past three years at a total cost in excess of $7,000,000. Three are located in The Bronx, two in Brooklyn and two in the congested lower East Side of Manhattan. Altogether they provide accommodations for approximately 1,200 families. At the present time there are before the State Board of Housing applications for three new projects to cost approximately $4,000,000. With their completion, total construction under the law will represent an investment of $11,000,000. The buildings will contain about 7,500 rooms and provide accommodations for approximately 2,000 families at monthly rentals ranging from $9.00 to $12.50 per room per month. The latest development was the completion in December, 1930, of the Amalgamated Dwellings, on the lower East Side. This building, coöperatively owned, contains 234 apartments with over 900 rooms. It is equipped with automatic elevators, incinerators, electric refrigeration, tiled roof, and surrounds a large central court of 15,000 square feet. Another recent development on the East Side is a project completed by the Stanton Homes Corporation, housing 44 families in 135 rooms at an average rental of $12.50 per room per month. A large project, located in the Navy Yard section of Brooklyn, was completed and is now fully occupied by 111 families paying an average rental of $10.50 per room per month. All of these projects were erected in the heart of the most crowded tenement sections on sites formerly occupied by obsolete buildings.

SLUM CLEARANCE

Unemployment Factors.—Widespread unemployment in the past year has given special impetus to plans for slum clearance and for erecting model dwellings, especially in the larger cities. From many quarters has come the plea that one of the most socially useful methods for increasing employment was to replace old law tenements by model apartments. The American Construction Council, in a letter recently addressed to the governors of every state in the nation and to the mayors of all cities of over 100,000 population, called for constructive measures for the re-building and modernizing of slum or obsolete tenement districts in American cities. This action was taken in connection with a nationwide program promoted by the Council toward the rehabilitation of the building industry and the employment of many thousands of workers in re-building blighted areas.

Housing Association of New York.—The recently formed Housing Association of New York, of which former Governor Alfred E. Smith is president, has sponsored the creation of a large housing fund to be used in the reconstruction of tenement areas of New York City. This organization is to act as a coördinating agency for all who are interested in promoting better housing. It will aim to direct public opinion in support of necessary legislation, as well as to enlist the aid of persons capable of financing new projects.

Plan for New York City.—A plan advanced by Mayor Walker of New York City for a large low cost housing development on seven blocks extending from Canal to East Houston Streets between Chrystie and Forsythe Streets, for many years one of the most congested areas of the lower East Side of Manhattan, is still to be mentioned as a promising event for future slum clearance. This area, acquired by the city for purposes of street widening, is now being cleared and various agencies have suggested plans for the building of apartments on these blocks at rents ranging from $9.00 to $22.00 per room per month. Final action, however, awaits the decision of the city authorities.

WORKMEN'S DWELLINGS

Sunnyside and Radburne.—With the decrease in commercial building, there has been a marked increase in the activities of limited dividend corporations engaged in the erection of workmen's dwellings. The City Housing Corporation, which is responsible for Sunnyside in the Borough of Queens, and Radburn, a new town in New Jersey, has continued its interesting housing experiments. Sunnyside now houses about 1,200 families in 563 one-, two- and three-family houses and in several apartment buildings. Cost of the work completed in Radburn is over $3,000,000, which covers the construction of 175 one-family houses, 10 two-family houses and an apartment group for 92 families.

Queens Development.—The City and Suburban Homes Company, a non-profit corporation, and the Henry E. Phipps Fund, which was created to promote better housing for wage earners in New York City, have expanded /their program during the past year after several years of inactivity. The City and Suburban Homes Company has recently acquired property in Queens on which about 1,000 apartments will be constructed. The Phipps Estate has purchased land adjoining Sunnyside, on which apartments will be constructed during the winter.

Housing for Negroes.—It is important to note that the Paul Laurence Dunbar Apartments for Negroes in Harlem have been most successful from the point of view of occupancy and of return on the investment. Of the John D. Rockefeller, Jr. housing projects, which include the Andrew J. Thomas Apartments in The Bronx, and the model tenements for workers in New Jersey, the Dunbar apartments is perhaps the most successful financially. The success of the two outstanding experiments in housing for Negroes in Chicago, namely the Michigan Boulevard apartments financed by Marshall Field and the project erected by Julius Rosenwald, further emphasize the great need for model tenements at low rentals for Negroes in the larger cities.

BUILDING PRACTICE AND METHODS

Although the past year has marked no appreciable advance in legislation governing housing standards in the country at large, material improvement is evidenced in building practice as applied to the construction of multi-family dwellings. This has been brought about in part by technical advances in the building industry through adoption of new methods of construction and the incorporation of facilities which are becoming essential in the modern apartment building. There is evidence of a growing tendency on the part of commercial builders to make use of methods developed in non-profit housing experiments, with the consequent reduction in land coverage, planning of the site to mass the open spaces in large playgrounds and courts, and the planning of the building to insure through ventilation for every apartment.

SOCIAL HYGIENE

By Mary S. Edwards

American Social Hygiene Association

OFFICIAL ORGANIZATIONS

Bureau of Venereal Diseases.—The Federal Government in the field of social hygiene is represented especially by the Bureau of Venereal Diseases of the U. S. Public Health Service. The Bureau's functions are designated by law to include: (1) scientific research into the treatment and methods of control of the venereal diseases; (2) coöperation with state and olcal health authorities in the development and maintenance of control measures; and (3) educational work, carried on through conferences and demonstrations, the publication and distribution of literature, and circulation of moving pictures and other exhibit material, and the presentation of lectures, practical talks and scientific papers to selected groups.

State Activities.—Most state governments carry on some kind of social hygiene program, either under a separate venereal disease or social hygiene division in the state department of health, or as part of the general communicable disease program. State activities vary widely, some states carrying on extensive sex-character education work as well as popular health instruction. Some states interest themselves in law enforcement against commercialized prostitution, and the elimination of venereal disease carriers. Other states with but small appropriations for this type of work are forced to limit their services to distribution of free pamphlets and exhibit materials, and sometimes free arsphenamine for use with indigent patients. These activities are carried on in coöperation with the Federal Government.

City and Town Boards.—City and town health boards also include social hygiene activities in their programs. The Appraisal Form of City Health Work of the American Public Health Association includes venereal disease control as one section of its standard of measurement of the "degree to which citizens collectively have bestirred themselves to protect and advance their health." The city rating is based on: first, the reporting of venereal disease cases; second, the treatment of cases (a)) whether material freely and immediately available to physicians, hospitals and clinics upon request; (b) the volume of clinic registration, and (c) number of clinic visits; and, third, control practices (a) per cent of cases returned to physicians, hospitals or clinics after having discontinued treatment while the disease is still communicable; (b) cases reporting sources of infection, and (c) probable sources of infection which are located and subsequently examined. Dr. William F. Snow has outlined the following public health, medical, nursing, and related measures as those which should receive adequate support by local health authorities in coöperation with physicians and voluntary agencies: (1) Medical advice and diagnosis for infected individuals; (2) Treatment for their benefit and for the protection of the public; (3) Personal instruction regarding protection of others from infection; (4) Social service follow-up measures to keep the patients under continuous treatment or observation and to ensure the protection of the public; (5) Requirement of notification of cases to the health authorities under specific conditions adapted to purposes of control and eradication of these diseases; (6) Isolation or quarantine measures applied when necessary because of inability, refusal, or failure of the individual to carry out instructions of the Health Department.

Voluntary Organization. — The American Social Hygiene Association is the national voluntary organization for social hygiene, with approximately 11,000 members. It is affiliated with 35 organized local social hygiene groups in 22 states and the District of Columbia. Many other national and local agencies and societies include particular phases of social hygiene work in their programs, or conduct special programs. Some of these are the National Congress of Parents and Teachers, the National Woman's Christian Temperance Union, the National Council of Women, the General Federation of Women's Clubs, the American Medical Association, the Federal Council of Churches, the National Organization for Public Health Nursing, the National Society for the Prevention of Blindness, the International Association of Policewomen, the National Social Work Council, and many others. Working separately and in coöperation official and voluntary agencies have a fair record of accomplishment as a result of 1930 activities.

DEVELOPMENT OF SPECIAL PUBLICITY METHODS

During 1930 a special project has been carried on with the Julius Rosenwald Fund, The American Social Hygiene Association and various interested Boston, Chicago and New York City social hygiene agencies to test out the effectiveness of various materials and methods of popular health publicity in getting persons infected with a venereal disease under treatment. The demonstration in New York City in connection with the Bellevue-Yorkville Health Center occupied three months. During this time every possible means were used to bring the subject to the attention of persons in the area. Careful checks were made with physicians, hospitals, and clinics at the beginning and end of the period to find out whether there had been an increase in patients, and what had led these patients to seek treatment. Similar demonstrations are planned for other cities with special consideration of variations in racial groups, and environmental factors.

WHITE HOUSE CONFERENCE

This important organization included social hygiene as a major topic for discussion. The Sub-Committee on Education and Training studied problems of social hygiene in relation to child health and protection with special reference to sex education. The Sub-Committee on Delinquency included discussion of crime prevention, and protective measures. Several other sub-committees covered the various preventive and treatment aspects of venereal diseases in childhood.

LEGAL AND PROTECTIVE MEASURES

City Surveys.—The American Social Hygiene Association made 25 fact-finding city surveys of commercialized prositution conditions in 20 cities in 8 states, in coöperation with local authorities and voluntary agencies, in an attempt to secure data to be used as a basis for betterment of conditions. In addition extensive studies were made of road-houses in Massachusetts and in the vicinity of New York City, for similar purposes.

New York.—An important development in the protective measures work of the country is the organization of the Crime Prevention Bureau of the New York Police Department with Henrietta Additon as Director. This Bureau with a specially trained force of almost 150 men and women officers will handle juvenile cases and bend their main efforts toward prevention of delinquency.

League of Nations.—In 1930 the League of Nations began an intensive study of Traffic in Women and Children in the Far East. This is an extension of the earlier study of the same subject in European countries, South America and the United States. Bascom Johnson is Chairman of a Travelling Commission of Three, of the League Committee on Traffic in Women and Children, which will visit the Orient.

EDUCATIONAL WORK

Teacher Training.—In this phase of social hygiene notable progress has been made during the year in the training of specially qualified teachers and leaders for sex education work. The American Social Hygiene Association conducted 9 training courses for teachers in regular sessions of educational institutions, including the Universities of Cincinnati, New York, and Columbia, the Virginia State Normal and the Alabama State Normal College, and such negro institutions as Tuskegee and Hampton.

The Federal Council of Churches has taken an active part in sex-character educational work by giving training courses at ministerial institutes, preparing articles and publicity for the religious press, and organizing discussion courses on marriage and family life. That church boards and councils, and other religious bodies are well represented at all social hygiene conferences and meetings is evidence of the acceptance of social hygiene principles by religious educational groups.

Family Relations. — A special phase of social hygiene growing in importance is that directed toward promotion of successful family life. Inquiries sent by the American Social Hygiene Association to about 450 women's colleges, co-educational colleges and universities, theological schools, and denominational schools indicate that nearly all educational institutions are in some way incorporating such teachings in their curricula. The Church as well as the school is providing courses on the family in ministerial institutes. Consultation services in the interest of wise marriage choices, successful family life, and competent parenthood are being organized, and tested out as to usefulness, in various parts of the country.

VENEREAL DISEASES

Studies and Reports.—During the past few years particular stress has been laid upon the necessity of having adequate statistics of the extent of syphilis and gonorrhea. The United States Public Health Service in 1930 published an interesting summary of some of the most recent researches into venereal disease prevalence. The American Social Hygiene Association and the U. S. Public Health Service in coöperation with local agencies have made a series of studies of prevalence by the census method, of selected communities with a total of almost 18,000,000 population. All physicians, hospitals and clinics in these communities were asked to give the number of cases of venereal infections under treatment on a given day. Based on these figures it is estimated that in the whole country there are 643,000 cases of syphilis and 474,000 cases of gonorrhea constantly under medical care. About one-third of these are probably indigent patients, and treated at public expense. Among males there is a higher prevalence than among females (based on cases under treatment—syphilis, males 4.77 per 1,000, females 3.08; gonorrhea, males 4.88, females 1.78), and among negroes the rate is higher than among the white race (for both venereal diseases, 11 per 1,000 as against 8). Recently Wassermann tests on 2,300 rural negroes in a southern state showed 24 per cent over one year of age with syphilis. The results of a number of published reports over a ten year period indicate that of women admitted to maternity hospitals 6.9 per cent had a positive Wassermann reaction. General paralysis contributes 4 per cent of the population of insane institutions. Syphilis stands first or second among the most frequently reported infections to the U. S. Public Health Service from the several state health departments. Gonorrhea stands about fifth. Among the general male population between the ages of 15 and 45 it is estimated that the number of non-effective days lost through venereal disease would approximate 21,000,000 days per annum, or a loss of about one-half day for each male of the United States between the ages of 15 and 45.

Medical Measures.—Among the many important contributions to the work against venereal diseases in 1930 should be mentioned the nation-wide program for public understanding and action for the prevention of congenital syphilis, backed by official and voluntary agencies, under the special stimulus of the American Social Hygiene Association. There should be mentioned also the studies of the health of Indians which are furnishing valuable data for use in health programs for the benefit of the Indian peoples in the United States. In June, 1930, a second national conference for the health of seamen was held, with representatives from the many interested official, voluntary, and commercial groups. As a result a National Advisory Committee on the Health of Seamen was formed, with Dr. Edward L. Keyes as chairman. The American Social Hygiene Association has in the past year conducted very effective studies and follow-up activities relative to quackery and drugstore treatment. Coöperation with local authorities has resulted in the closing of many offices of advertising charletans, and the elimination of thousands of dollars worth of illegal and unethical advertisements from magazines and newspapers.

CONFERENCES AND MEETINGS

Important social hygiene gatherings during 1930 were: the annual meeting of the American Social Hygiene Association in New York City, Jan. 17-18; a special meeting in coöperation with Massachusetts agencies and the National Conference of Social Work in Boston, June 7-14; the Southern States Social Hygiene Conference in New Orleans in coöperation with the Louisiana State Board of Health and the New Orleans Central Council of Social Agencies, May 26-27; the Social Hygiene Institute in coöperation with the Texas State Department of Health and the American Public Health Association, Fort Worth, Oct. 28; and special social hygiene meetings at the New York (Elmira, Nov. 20) and New Jersey (Elizabeth, Dec. 4) State Conferences of Social Work.

MENTAL HYGIENE

By George K. Pratt

National Committee for Mental Hygiene

FIRST INTERNATIONAL CONGRESS

During 1930 the outstanding mental hygiene event was the First International Congress on Mental Hygiene, held at Washington, May 15-0. This occasion was sponsored by The National Committee for Mental Hygiene (U. S. A.), and the various meetings attracted 3,500 members and delegates from 6 continents, 53 countries, and 45 states in the United States. Forty-five major topics for discussion were included in the program, and as many or more were listed in the programs of kindred psychiatric and mental hygiene organizations which met with the Congress. Over one hundred national and state agencies, representing every field of professional interest in mental hygiene—psychiatry, medicine, psychology, social work, nursing, public health, education, law, religion, sociology, philosophy, eugenics, biology, industry, and others—participated in this affair. An unique feature of the Congress, which contributed greatly to its value and success, was the printing and distribution, in advance of the meetings, of all the major communications in English, French and German. At the conclusion of the Congress, recommendations of eight committees, covering such subjects as statistics, institutions, legal measures and laws, clinics, mental hygiene in prisons and among delinquents, dependency, industry and social work, were submitted and were accepted as constituting the official objectives of the Congress. Also during this week in Washington occurred the organization of the International Committee on Mental Hygiene, which will attempt to continue on an international basis the work begun in the United States by The National Committee for Mental Hygiene.

NATIONAL COMMITTEE FOR MENTAL HYGIENE

The year also marked the end of the first twenty years of mental hygiene work in America. Coincident with the close of the year came the retirement of Dr. Frankwood E. Williams, for eight years the Medical Director of The National Committee for Mental Hygiene. The Committee began in the closing months of the year a vast reorganization program commencing with the appointment of Dr. C. M. Hincks as General Director of the National Committee. Previously Dr. Hincks had been Medical Director of the Canadian National Committee for Mental Hygiene, with headquarters in Toronto.

SURVEYS AND STUDIES

Educational Methods.—The past year likewise saw a number of important surveys and studies undertaken in the field of mental hygiene. Among them was an intensive study of educational methods as used by mental hygiene organizations. This study was financed by The National Committee for Mental Hygiene and was undertaken jointly by the National Committee and the New York State Committee on Mental Hygiene of the State Charities Aid Association. The study was nation-wide in scope, and a published report of its findings will be available in the spring of 1931.

Boston and Pittsburgh.—Two major cities and two states likewise undertook surveys of their mental hygiene facilities. Boston, through a grant from the Commonwealth Fund supplemented by certain local resources, has been inventorying and evaluating its various facilities for dealing with mental hygiene problems. A similar study, although considerably more limited than the Boston one, was undertaken in Pittsburgh preparatory to the establishment in that city of a child guidance clinic and nursery school, towards which a grant of $168,000 has been made by the Buhl Foundation of Pittsburgh.

Connecticut.—The Commonwealth Fund likewise assisted in the financing of a state-wide survey of mental hygiene resources and needs in Connecticut. This survey was conducted by Dr. Samuel W. Hamilton, with the aid of a competent staff, and will enable well-informed citizens of Connecticut to draw up intelligently for many years in advance a program of mental hygiene that will adequately meet the needs of the entire state.

Illinois.—A survey was made by the Illinois Society for Mental Hygiene (financed by The National Committee for Mental Hygiene) of private sanitaria for mental disease in that state.

PERSONNEL PROBLEMS

Shortage of Trained Workers.—The personnel situation in the professional field of mental hygiene remains as acute as ever. Despite the awarding of nearly a score of fellowships for training in extramural psychiatry, both by The National Committee for Mental Hygiene (through funds donated by the Rockefeller Foundation) and by the Commonwealth Fund, a number of important clinic projects must be held in abeyance until adequately trained personnel is available. There is some reason to expect that before the close of 1931 an extensive program relating to psychiatric education will be launched, and, as one of the products of this program, an appreciable lessening of the shortage of trained personnel can be looked for.

CARE AND TREATMENT OF THE MENTALLY SICK

Psychiatric Service.—Three important steps were taken by the American Medical Association at its last annual convention to direct scientific attention to the growing problem of mental disease which, the convention declared, presents one of the most serious situations with which medicine is at this time concerned. Resolutions were adopted advocating psychiatric service in criminal courts and prisons, ordering that an investigation be made through the Council on Medical Education and Hospitals of hospitals, laboratories and research facilities in the care and treatment of the mentally sick, and creating a special committee whose duty it will be to concern itself solely with this problem.

New Federal Hospital.—Congress has passed and the President has approved a bill (Public Act No. 201) authorizing the establishment of a hospital for defective delinquents, the first institution of its kind under Federal auspices. Under the act, the Attorney General is directed to select a site for a hospital for the care and treatment of "all offenders against the United States who are in the actual custody of its officers or agents, and who at the time of their conviction or during their detention are or shall become insane, afflicted with an incurable or chronic degenerative disease, or so defective mentally or physically as to require special medical care and treatment not available in an existing Federal institution." The hospital will have a capacity of 600 to 750 beds and is expected to relieve St. Elizabeth's Hospital of all of its criminal insane. It is also hoped that the new institution will, in time, become the medical center for the whole Federal penal and correctional service.

New Institute of Pennsylvania Hospital.—The most important and promising addition to the Nation's resources was dedicated in Philadelphia in May, 1930, in the Mental Hygiene Institute of the Pennsylvania Hospital, under the direction of Dr. Earl D. Bond. The purpose of the Institute is to help bring psychiatric service (one of the most extensive forms of medical care) within the reach of persons of moderate means. Most patients do not require bed care. They go to the pay clinic by appointment to consult members of the staff with all the privacy and individual attention of a physician's private practice, receiving service in special departments also as it may be required. The full rate, covering the actual cost of both institutional charges and professional services is $10.00 for the first visit and $3.00 for each succeeding visit. A special rate of $5.00 and $1.00 and a minimum rate of $1.00 and 50 cents are arranged for those whose incomes and family responsibilities make it impossible for them to pay the full cost.

New York State Bond Issue.—That the general public in many states is becoming more impressed with the need for better provisions for the care of the mentally sick is indicated by the $50,000,000 Bond Issue, voted by the citizens of New York State in November, for the construction of additional state mental hygiene and correctional institutions. This is the second time in seven years, in New York State, that the question as to whether recourse should be had to the state's credit for urgently needed institutional construction has been submitted to a referendum of the people. In 1923 a similar bond issue was voted. Overcrowding in New York State hospitals is probably in proportion or no worse than that existing in practically every other state in the country. Nevertheless, overcrowding in New York State has increased from 20.3 per cent in 1911 to 35.4 per cent in 1930.

NEW EDITION OF CLINICAL DIRECTORY

Work was begun the past year on a new edition of the previously published *Directory of Psychiatric Clinics for Children,* under the auspices of the Division of Publications of the Commonwealth Fund. In addition to bringing the directory up to date an important supplement is contemplated this year to consist of the inclusion of elaborate data listing also all psychiatric clinics in the United States which serve adults.

CHILD WELFARE

By C. C. Carstens

Executive Director, Child Welfare League of America, Inc.

WHITE HOUSE CONFERENCE

The most important single event in this field in 1930 was the convening in November of the White House Conference on Child Health and Protection. It was called by President Hoover the year before and given ample time and money from private funds to make a summary of the knowledge now available in the field and recommendations for further developments. The tentative reports covered what is now being done in the various fields, what should be done now or in the near future, and how this may best be accomplished. The reports as modified by the Conference are now being prepared for final publication and will make a five-foot shelf on child welfare.

The Children's Fund of Michigan, established by Senator James Couzens, has made possible a clinical study of the problem of delinquency in Detroit, coordinated with the program of the Yale Institute of Human Relations.

BIRTH AND INFANT MORTALITY RATES

States.—Official announcement of the U. S. Bureau of the Census in its provisional figures for 1929 shows a decrease of 3.6 per cent in the number of live births in 40 of the 43 states constituting the birth registration area of the United States, as compared with the number in the same area in 1928. Four States (Arizona, Michigan, Montana and Tennessee) reported an increase number of births in 1929. The infant mortality rate for 1929 in the 43 States was 1.5 lower per thousand live births than the corresponding rate for 1928, being 67.3 for the States included. In the area the highest rates were 133.3 for Arizona, 91.4 for Colorado, 90.9 for South Carolina. The lowest rates were 47.9 for Oregon, 49.5 for Washington.

Cities.—For 39 of the cities having populations of 100,000 or more, the infant mortality rates for 1929 were lower than those for the preceding year. The highest rate was that of Nashville, Tenn., 98.1, and the lowest that of Portland, Ore., 42.5. The 720 cities of the United States Birth Registration Area, with a population of 10,000 or more, reported an infant mortality rate of 66 per 100,000 live births, which is two points lower than the rate for 1928 and the second lowest rate on record in the United States. The cities of more than 250,000 population as a group showed the lowest rate (63). Portland, Ore., of this group had the best record, with a rate of 43, and Seattle next with a rate of 46. Of the cities with population between 100,000 and 250,000 St. Paul headed the list, with a rate of 46, and in the group of 50,000 to 100,000, Union City, N. J., stood first, with a rate of 25. The rates for the ten largest cities in the country were as follows:

New York and St. Louis	59
Chicago	60
Cleveland	61
Philadelphia	62
Los Angeles	65
Detroit and Boston	69
Baltimore and Pittsburgh	73

League of Nations Statistics.—Official statistics of the League of Nations show the general death rate, the infant mortality and the birth rates for the following cities:

	General mortality per 1,000 inhabitants	Infant mortality per 1,000 live births	Births per 1,000 inhabitants
Paris	15.1	101	14.8
Vienna	14.4	79	10.0
London	13.8	70	15.7
New York	12.8	59	20.5
Berlin	12.1	86	9.6

PARENT MORTALITY

The number of children handicapped from birth by the loss of their mothers from puerperal causes is estimated to be 3.4 per one thousand live births. This means that in the population of the United States at the present time there are about 400,000 persons whose mothers died when they were born. The proportion of children born after the death of their fathers is estimated to be one in 280, which would mean that there are also about 400,000 persons in the United States whose fathers died before they were born. An analysis of age groups of 629 maternal deaths that occurred in New York City in 1929 indicates that the safest child-bearing period is between the ages of 15 and 30. The rise in the maternal death rates on reaching between thirty and thirty-four years is abrupt, with another sharp rise in the next five-year period. It is pointed out that the fact that the maternal mortality rate remains relatively stationary may be due to later marriages and delay in the bearing of children, which have raised the average age of mothers.

HEALTH

Rural.—The Commonwealth Fund, New York, has chosen Tennessee and Massachusetts as the States in which to develop a public health project for promoting rural health, in coöperation with the State Health Departments.

Deaths from diphtheria in New York City the first quarter of 1930 dropped to the low figure of 82, a reduction of 56 per cent, as compared with the average of the first quarter for the last six years. During the last six months of 1929 when the effects of immunization became fully operative there were 137 deaths as compared with a total of 325 during the first six months of the same year. Not one of the 137 victims of the disease had taken the complete series of toxin-anti-toxin treatments and the Schick test to determine immunity.

Cripples.—Crippled children in Virginia are to be treated in their own homes through the coöperation of local physicians, and only the more serious cases are to be sent to hospitals.

EDUCATION

The New York City Board of Education has established 80 additional classes for the various groups of handicapped children, making a total of classes of 1,156 in that city.

A Home for Destitute Crippled Children is being built at the University of Chicago. Two of the units will be available for surgical and roentgen services in connection with the Billings Hospital. A summer camp for crippled boys, under the auspices of the Rotary Club of New York, was established on Long Island. Plans and equipment and standards modified to meet the needs of crippled children were developed.

Classes for Deaf and Blind.—Virginia has also made the education of all deaf and blind children of the State compulsory and authorized local school authorities of cities and counties to establish and maintain special classes for the blind and partly seeing in the public schools.

MISCELLANEOUS

Social Statistics.—The Children's Bureau of the United States Department of Labor has taken over the registration of social statistics, organized by a private committee, in coöperation with the University of Chicago. The scope of the plan for registration will be enlarged.

Service Units.—The Chicago Orphan Asylum is developing small scattered units to take the place of its congregate institution housing 130 children. The use of foster homes has also been added to the project. New Mexico has established five local social service units in the State, with three more projected.

Children's Code.—The Massachusetts Commission on Laws Relating to Children has made its final report of necessary improvement in its children's code.

Housekeeper Service. — For the preservation of the family a number of Jewish case work agencies have organized professional housekeeper service, notably those in Baltimore, Philadelphia and Chicago.

Mental Cases.—Of 136 out of 156 individuals from Erie County, New York, who had been discharged from a state feebleminded institution and replaced in the community during a period of twenty years, eight had made satisfactory and eleven fairly satisfactory adjustment to the community life. Of the remainder forty-three had criminal records, four were prostitutes, and a large number were living in dire poverty.

Mental Hygiene.—The First International Congress on Mental Hygiene was held in Washington in May, 1930. The role of mental hygiene in the training of the pre-school child, the treatment of the child of superior intelligence, the neurotic child, the child with sensory or motor defects, were topics discussed. A Division of Mental Hygiene has been established in the United States Public Health Service, with responsibility among other things for the conduct of studies and investigations as to the causes, prevalence and means for the prevention and treatment of mental and nervous diseases.

Clinics.—The new building of the School of Education of New York University is making provision for a psycho-education and mental hygiene clinic, as well as for a clinic for the social adjustment of the gifted. Child guidance clinics have been opened in Houston, Tex., supported by the Community Fund, in Portland, Ore., to be conducted in close coöperation with the Portland Public Schools and the Juvenile Court, in Pittsburgh with a nursery school attached, and a full-time psychiatric service has been instituted for the Cleveland Juvenile Court.

COGNATE SOCIETIES

JUSTICE AND MAINTENANCE OF ORDER

AMERICAN BAR ASSN., Section on Criminal Law, Endicott Bldg., St. Paul, Minn.
AMERICAN CIVIL LIBERTIES UNION, 100 Fifth Ave., New York City.
AMERICAN COUNCIL OF LEARNED SOCIETIES, 597 Fifth Ave., New York City.
AMERICAN INSTITUTE OF CRIMINAL LAW AND CRIMINOLOGY, 357 E. Chicago Ave., Chicago, Ill.
AMERICAN LAW INSTITUTE, 3400 Chestnut Street, Philalelphia, Pa.
AMERICAN PRISON ASSN., 135 E. 15th St., New York City.
NATIONAL COMMITTEE ON PRISONS AND PRISON LABOR, 730 Fifth Ave., New York City.
NATIONAL CRIME COMMISSION, 120 Broadway, New York City.
NATIONAL POLICE CONFERENCE, 240 Centre St., New York City.
NATIONAL PROBATION ASSN., INC., 370 Seventh Ave., New York City.
NATIONAL SOCIETY OF PENAL INFORMATION, 114 E. 30th St., New York City.
SOCIETY FOR THE PREVENTION OF CRIME, 177 William St., New York City.
WOMEN'S PRISON ASSN., 110 Second Ave., New York City.

SOCIAL ORGANIZATIONS

AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE, 3622 Locust St., West Philadelphia, Pa.
AMERICAN NATIONAL RED CROSS, 17th and D Sts., N. W., Washington, D. C.
AMERICAN SEAMEN'S FRIEND SOCIETY, 72 Wall Street, New York City.
AMERICAN SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS, 50 Madison Ave., New York City.
AMERICAN SOCIETY FOR THRIFT, 9 E. 46th St., New York City.
BOY'S CLUB FEDERATION, 420 Lexington Ave., New York City.
BOY SCOUTS OF AMERICA, 2 Park Ave., New York City.
CHILDREN'S AID SOCIETY, 105 E. 22nd St., New York City.
CIVIC FORUM, 123 W. 43rd St., New York City.
FEDERAL COUNCIL OF CHURCHES, ETC. —Commission on the Church and Social Service, 105 E. 22nd St., New York City.
GIRLS FRIENDLY SOCIETY IN AMERICA, 15 E. 40th St., New York City.
GIRLS SERVICE LEAGUE OF AMERICA, 138 E. 19th St., New York City.
HUMANITARIAN LEAGUE, INC., 131 W. 74th St., New York City.
HUMAN PROGRESS ASSN., 220 W. 42nd St., New York City.
INTERCOLLEGIATE SOCIALIST SOCIETY, 70 Fifth Avenue, New York City.
NATIONAL CATHOLIC WELFARE CONFERENCE, 1312 Massachusetts Ave., N. W., Washington, D. C.
NATIONAL CONFERENCE OF SOCIAL WORK, 25 E. 9th St., New York City.
NATIONAL CONFERENCE FOR THE SOCIAL STUDIES, 671 Park Ave., New York City.
YOUNG MEN'S CHRISTIAN ASSN., International Committee, 347 Madison Ave., New York City.

SOCIAL FRATERNITIES

ALLIED PATRIOTIC SOCIETIES, INC., 299 Madison Ave., New York City.
ANCIENT & ACCEPTED SCOTTISH RITE OF FREEMASONRY,—Northern Jurisdiction, 117 Statler Building, Boston, Mass.—Southern Jurisdiction, 1733-16th St., Washington, D. C.

BENEVOLENT AND PROTECTIVE ORDER OF ELKS OF THE U. S. A., 2750 Lake View Ave., Chicago, Ill.

INDEPENDENT ORDER OF ODD FELLOWS, 12 West Chase St., Baltimore, Md.

INTERNATIONAL ADVERTISING ASSN., 420 Lexington Ave., New York City.

INTERNATIONAL ASSN. OF LIONS CLUBS 350 McCormick Building, Chicago, Ill.

KIWANIS INTERNATIONAL, 164 W. Jackson Blvd., Chicago, Ill.

KNIGHTS OF COLUMBUS, P. O. Box 1670, New Haven, Conn.

KNIGHTS OF THE KU KLUX KLAN, INC., 2621 Peachtree St., Atlanta, Georgia.

KNIGHTS OF PYTHIAS, 754 Security Building, Minneapolis, Minn.

LOYAL ORDER OF MOOSE, Mooseheart, Ill. (Supreme Lodge of the World).

MODERN WOODMEN OF AMERICA, 1504 Third Ave., Rock Island, Ill.

ROYAL ARCANUM SUPREME COUNCIL, 407 Shawmut Ave., Boston, Mass.

ROTARY INTERNATIONAL, 211 W. Wacker Drive, Chicago, Ill.

WOODMEN OF THE WORLD, Sovereign Camp, 14th and Farman Sts., Omaha, Nebraska.

(SOCIAL) HOME LIFE

LANDLORDS' COOPERATIVE ASSN., 116 Nassau St., New York City.

NATIONAL HOUSING ASSN., 105 E. 22nd St., New York City.

NATIONAL PLANT, FLOWER & FRUIT GUILD, 70 Fifth Ave., New York City.

NEW YORK ASSN. FOR IMPROVING THE CONDITION OF THE POOR, 105 E. 22nd St., New York City.

OWN-YOUR-HOME EDUCATIONAL CAMPAIGN FOUNDATION, 524 First Ave., New York City.

OWN-YOUR-HOME LEAGUE, INC., 151 W. 33rd St., New York City.

(SOCIAL) CHILDREN

BIG BROTHER MOVEMENT, INC., 315 Fourth Ave., New York City.

BIG BROTHER AND BIG SISTER FEDERATION, INC., 425 Fourth Ave., New York City.

CAMP FIRE GIRLS, INC., 31 E. 17th St., New York City.

CHILD CONSERVATION LEAGUE OF AMERICA, 205 W. Monroe St., Chicago, Ill.

CHILD WELFARE LEAGUE OF AMERICA, 130 E. 22nd St., New York City.

CHILDREN'S AID SOCIETY, 105 E. 22nd St., New York City.

HEBREW SHELTERING GUARDIAN SOCIETY OF NEW YORK, Pleasantville, N. Y.

NATIONAL CHILD LABOR COMMITTEE, 215 Fourth Ave., New York City.

NATIONAL CHILD WELFARE ASSN., 70 Fifth Ave., New York City.

SANTA CLAUS ASSN., INC., 152 W. 42nd St., New York City.

(SOCIAL) HEALTH

AMERICAN BIRTH CONTROL LEAGUE, 152 Madison Ave., New York City.

AMERICAN CHILD HEALTH ASSN., 370 Seventh Ave., New York City.

AMERICAN MISSION TO LEPERS, 156 Fifth Ave., New York City.

AMERICAN POSTURE LEAGUE, INC., 1 Madison Ave., New York City.

AMERICAN SOCIAL HYGIENE ASSN., INC., 370 Seventh Ave., New York City.

ANTI-CIGARETTE LEAGUE OF NEW YORK STATE, 209 W. 107th St., New York City.

BENEVOLENT SOCIETY OF THE U. S. FOR THE PROPAGATION OF CREMATION, 1828 Barnes St., New York City.

COMMITTEE ON DISPENSARY DEVELOPMENT, 151 Fifth Avenue, New York City.

EUGENICS RESEARCH ASSN., Cold Spring Harbor, L. I., N. Y.

NATIONAL COMMITTEE FOR THE DISABLED, 245 E. 23rd St., New York City.

NATIONAL HEALTH COUNCIL, 370 Seventh Avenue, New York City.

NATIONAL HOUSING ASSN., 105 E. 22nd St., New York City.

PLAYGROUND AND RECREATION ASSN. OF AMERICA, 315 Fifth Ave., New York City.

(SOCIAL) MORALS

AMERICAN ASSN. OF SOCIAL WORKERS, 130 E. 22nd St., New York City.

AMERICAN FUND FOR PUBLIC SERVICE, INC., 2 W. 13th St., New York City.

American Humane Assn., 80 Howard St., New York City.
Anti-Profanity League, Ware, Mass.
Charity Organization Society of the City of New York, 105 E. 22nd St., New York City.
Chicago Crime Commission, 300 W. Adams St., Chicago, Ill.
Morality League of America, 222 Madison Ave., New York City.
National Christian League for Promotion of Purity, 5 E. 12th St., New York City.
National Committee for Better Films, 70 Fifth Ave., New York City.
National Save-A-Life League, Inc., 50 E. 42nd St., New York City.
New York Society for the Suppression of Vice, 215 W. 22nd St., New York City.
Non-Smokers' Protective League of America, 101 W. 72nd St., New York City.
Safety First League, 47 W. 47th St., New York City.
Travelers' Aid Society of N. Y., 144 E. 44th St., New York City.

(SOCIAL) TEMPERANCE

Anti-Saloon League of America, 370 Seventh Ave., New York City.
Association Against the Prohibition Amendment, Room 935-941 National Press Building, Washington, D. C.
Catholic Total Abstinence Union of America, Pittsburgh, Pa.
International Narcotic Crusade, Inc., 156 Fifth Ave., New York City.
Moderation League, Inc., 385 Madison Ave., New York City.
National Temperance Society, 289 Fourth Ave., New York City.
World League Against Alcoholism, 150 Fifth Ave., New York City.

FOUNDATIONS

Carnegie Endowment for International Peace, 2 Jackson Place, Washington, D. C.
Carnegie Foundation, 522 Fifth Ave., New York City.
Carnegie Hero Fund Commission, 2307 Oliver Building, Pittsburgh, Pa.
Carnegie Institution of Washington, 16th and P Sts., N. W., Washington, D. C.
General Education Board, 61 Broadway, New York City.
Guggenheim Foundation, 551 Fifth Ave., New York City.
Hall of Fame for Great Americans, University of the City of New York, New York City.
Laura Spellman Foundation, 607 Hudson St., New York City.
Moro Educational Foundation, 475 Fifth Ave., New York City.
Rockefeller Foundation, 61 Broadway, New York City.
Rockefeller Institute, York Ave., and 66th St., New York City.
Roosevelt Memorial Assn., 28 E. 20th St., New York City.
Russell Sage Foundation, 130 E. 22nd St., New York City.
Woodrow Wilson Foundation, 6 E. 39th St., New York City.

WOMENS WORK AND PROGRESS

American Assn. of University Women, 1634—I St., N. W., Washington, D. C.
American Nurses' Assn., 370 Seventh Ave., New York City.
American Women's Assn., Inc., 220 Madison Ave., New York City.
Church Women's League for Patriotic Service, Inc., 132 E. 57th St., New York City.
General Federation of Women's Clubs, 1734 N. St., N. W. Washington, D. C.
National American Woman Suffrage Assn., 171 Madison Ave., New York City.
National Association of Women Painters and Sculptors, 17 E. 62nd St., New York City.
National Council of Administrative Women in Education, 1211 Gilpin Ave., Wilmington, Delaware.
National Council of Women, U. S. A., 370-7th Ave., New York City.
National Federation of College Women, Rolla, Mo.
National League of Girls' Clubs, 472 W. 24th St., New York City.
National League of Women Voters, 532 17th St., N. W., Washington, D. C.

National Woman's Christian Temperance Union, 1730 Chicago, Ave., Evanston, Ill.

National Woman's Relief Corps, 64 Spring St., Oberlin, Ohio.

National Woman's Party, 21 First St., N. E., Washington, D. C.

Professional Women's League, 56 W. 53rd St., New York City.

Southern Women's Educational Alliance, Hotel Richmond, Richmond, Va.

Women's Christian Temperance Union, 1730 Chicago Ave., Evanston, Ill.

Women's Educational and Industrial Union, 264 Boylston St., Boston, Mass.

Woman's Roosevelt Memorial Assn., Roosevelt House, 28 E. 20th St., New York City.

Women's Trade Union League, 247 Lexington Ave., New York City.

DIVISION XVI

LABOR AND LABOR LEGISLATION

LABOR CONDITIONS AND ORGANIZATIONS

By Ethelbert Stewart

Commissioner of Labor Statistics, Department of Labor

THE GENERAL SITUATION

The period under review has been a difficult one for all workers. Widespread business depression beginning late in 1929 and continuing throughout 1930, together with the increasing use of labor-displacing machinery and mergers of business firms, resulted in an unemployment situation reaching unusual proportions. Such being the conditions, much progress in unionization was not to be expected. Nevertheless the American Federation of Labor reported an increase in membership from 3,040,600 in 1929 to 3,067,800 in 1930. The Federation has been concentrating its organizing work largely in the southern states, especially among the mill workers, and several strikes have been waged, but without conspicuous success. The year 1929 was productive of more labor disputes than any year since 1926, but these were generally small, the number of persons involved being smaller than for any previous year recorded. During the first 10 months of 1930 a much smaller number of strikes took place than in the same period of 1929, while only 137,157 persons were involved as compared with 216,634 in the first 10 months of 1929.

WAGES AND HOURS OF LABOR

Extension of Short Week.—Some progress was made in the extension of the 5-day week. The American Federation of Labor reports more than 500,000 union workers as enjoying the short week. Among these the building trades lead, but the short week is also very prevalent in the clothing trades. These figures, of course, do not cover unions not affiliated to the Federation and are, therefore, not complete even as regards all organized workers.

Wage Rates.—Leading employers, at the White House Conference, pledged themselves not to impose wage cuts on their employees, and in the main this promise has been kept. Increases in wage rates of varying amounts have been reported in many instances, notably in the building trades, and in railroad employments. Many individual establishments, however, have decreased wages, the industries which figured most commonly in the reports to the Bureau of Labor Statistics being the textile industries, sawmill and lumber industry, hosiery industry, foundries and machine shops, furniture industry, and brick manufacture.

LABOR LEGISLATION AND COURT DECISIONS

Workmen's Compensation.—The outstanding enactment in the field of labor legislation during the period under review, was the passage of a workmen's compensation law in North Carolina in 1929, leaving Arkansas, Florida, Mississippi and South Carolina as the only remaining states without such a law. The effect of other enactments in the labor field was, in general, to strengthen existing laws and to enlarge their scope.

"Yellow Dog" Contracts.—Wisconsin passed a law declaring that any agreement whereby a worker bound himself not to join a labor organization was void. This law, aimed at the so-called "yellow dog" contracts which have increasingly come into use in the past few years, is the first of its kind, and is already under fire in the courts, a shoe company in the state having filed suit attacking its constitutionality. No action has as yet been taken in Congress on the bill prohibiting injunctions in labor disputes.

Collective Bargaining.—A victory was won by organized labor in the recent Supreme Court decision upholding the right of railroad employees to bargain collectively through representatives of their own choosing, thus disposing of the case of Texas & New Orleans Railway Co. and the Brotherhood of Railway Clerks (50 Supreme Court 427).

UNION BENEFITS

Payments.—According to the report of the executive council of the American Federation of Labor, made to the 1930 convention, the international unions paid in benefits during 1929 the sum of $32,242,444, of which $2,831,937 was for sickness, $17,598,287 was for death, $276,718 was for unemployment $4,883,028 was for old-age pensions, $2,707,188 was for disability, and $3,945,288 was in miscellaneous benefits.

Care of Aged.—Extension of benefits was considered by many labor conventions, but perhaps those receiving the greatest amount of consideration were the proposed establishment of old-age pensions and unemployment benefits. The 1929 conventions of photo-engravers, lathers, and barbers considered the adoption of an old-age pension plan but all of them rejected it. In 1930, the annual meeting of the Amalgamated Clothing Workers passed a resolution favoring the establishment of both a home for aged and a pension scheme "if conditions permit it." The hotel and restaurant employees' union has established a "trail blazer's old-age pension fund" to which contributions are being invited from members, with the idea of accumulating money to be used eventually in the payment of pensions. The 1930 meeting of meat cutters and butcher workmen went on record as favoring the establishment of both a home for aged members and a pension plan. Under the action taken by the convention the approval of every local was necessary and this has now been obtained. It is planned to finance the home by means of a livestock and ranching business owned and operated by the unions through a subsidiary company. The locals will be urged to erect cottages on the ranch, to be occupied by retired members, who will perform such tasks as they are fitted for. It is remarked that in this way the organization will be "setting its members up in a business that is right next door to their life work." The plan also contemplates the education of orphans of deceased members.

Pension System.—Local No. 306 (New York City) of the Motion Picture Machine Operators' Union has recently established a pension system providing for pensions to members disabled from accident or occupational disease who have reached the age of 60 years and have been in good standing in the organization for 15 years. The plan was operative Jan. 1, 1931. The pension will be $25 a week. The funds will be raised at least in part by the operation of a truck advertising business which has been taken over by the union.

Benefit Agreements.—The electrical workers' unions of New York and Chicago have secured agreements with the contractors under which members receive old-age and permanent disability benefits; these two agreements provide protection for some 15,000 members. The whole cost is borne by the employer. Each member receives $3,000 life insurance, total disability benefits of $30 a month, and an old-age pension of $40 per month after reaching 65 years of age. The pension plan is operative March 1, 1931. As each member already has $2,000 life insurance and a death benefit of $1,000, besides an old-age pension of $42 per month, all provided by the union, the new agreement puts these workers among the most fully protected of union workers, with insurance totaling $6,000 and pensions totaling $82 a month. Unlike most plans, the worker is not, under the new plan, required to remain with the same employer in order to retain his benefits; they hold good with any employer having contractual relations with the local union.

PUBLIC SOCIAL INSURANCE

Pension Legislation.—The provision of public old-age pensions has received considerable study by state legislatures. Bills have been introduced in many states. At the end of 1929 legislative action had been taken in 10 states (California, Colorado, Kentucky, Maryland, Minnesota, Montana, Nevada, Utah, Wisconsin, and Wyoming) and Alaska. Since that time laws have been passed in New York and Massachusetts and undoubtedly the year 1931 will see a further extension of the movement for the public care of aged, indigent citizens.

Attitude of Labor Federation.—The American Federation of Labor has generally opposed the enactment of social insurance laws. A rather significant statement in the report of its executive council to the 1930 convention, however, relative to old-age pension laws, states that: "The executive council has considered most carefully all the laws that have been enacted. It has not endorsed any of the measures thus far proposed as a standard act. We hope to draft a measure which will be practical, constructive and adequate."

Unemployment Program.—As regards the unemployment situation, the program of this body includes a nationwide system of public employment offices, national employment statistics, reduction in hours of work, stabilization of industry and the establishment of a national economic council representative of all production and consumer groups to coördinate the stabilization of the various industries, increased efficiency in management and sales policies, use of public works to meet cyclical unemployment, vocational guidance and retraining, special study of technological unemployment, and a study of the various plans "legislative and otherwise," that have been advanced as relief for the unemployed.

The Brotherhood of Railway Clerks has recently gone on record as favoring a complete system of public social insurance, including compulsory unemployment insurance and old-age pensions.

UNEMPLOYMENT INSURANCE

As would be expected, considering the widespread unemployment of the past year, the subject of unemployment insurance has received a great deal of attention in labor circles. A number of industries have already taken steps to provide protection for their unemployed workers, through joint action of employers and unions. Only one addition to this group was recorded for 1929-30—a system provided for the hosiery industry by the collective agreement which went into effect Aug. 1, 1930. The question of reviving the demand for the unemployment insurance which, just won, was dropped at the settlement of the left-wing strike in the fur industry in 1925 has recently been broached in the columns of the publication of the fur workers' union.

An agreement signed early in 1930 called for the reestablishment of an unemployment insurance fund in both the dress and cloak industries in New York City "as soon as the unionization of the industry and the enforcement of uniform standards have reached a point at which the provisions for the payment of unemployment insurance contributions can be substantially enforced throughout the industry," while the agreement of the embroidery workers of New York City, which runs until Aug. 25, 1931, provides for a joint fund maintained by contributions of 2 per cent of payroll from the employers and of 1 per cent from the workers, to be administered by the union.

MISCELLANEOUS EVENTS IN THE LABOR FIELD

Other incidents of interest in the labor field during the period are the establishment of the Railway Employees' Research Foundation, whose purpose is the conduct of scientific studies in the railway industry; the establishment of a legal aid bureau for members by the Brotherhood of Railroad Trainmen; the closing of the Brotherhood of Railway Clerks' Bank and its subsequent sale to another banking institution; the holding of a 4-day conference on labor problems and trade-union organization by the Brotherhood of Railway Clerks; the incorporation by the cigar makers' union of a coöperative association for the purpose of the collective purchase of supplies and materials for the employers in the cigar industry; the merger of the John Mitchell Life Insurance Co. and the Union Coöperative Insurance Association; the establishment of the office of impartial chairman in the cleaning and dyeing industry; and the move toward the affiliation of the railroad brotherhoods with the American Federation of Labor.

LABOR LEGISLATION

By Irene Osgood Andrews

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SOCIAL INSURANCE

The legislatures of nine states, two insular possessions, and Congress, met in regular session 1930. In addition, several special sessions were called. Perhaps the most significant labor legislation enacted was in the field of social insurance. "Old-age relief" laws, enacted by New York and Massachusetts, provide for "adequate assistance" to qualified citizens 70 years of age or over, and a commission was created in New Jersey to investigate old-age dependency and pension laws. In addition to these acts, retirement laws for public employees were amended by four states, Porto Rico and Congress; and Massachusetts established a special commission to study its state retirement system. Virginia directed a study of pensions for certain public employees while Mississippi extended its firemen's pension law to include policemen, and authorized group insurance for state employees.

WORKMEN'S COMPENSATION

In the field of workmen's compensation, the most notable advance was made in Virginia which liberalized the utterly inadequate law by raising the per cent of wages granted in case of disability, and increased the allowance for burial expenses from $100 to $150. Massachusetts clarified her law by several amendments. New York, which still retains the discredited "specific schedule" method of compensating occupational diseases, added three diseases to the list, not including, however, the deadly silicosis. The weekly minimum for the loss of both eyes in New York was raised from $8 to $15. Several minor changes were made in the Porto Rico law. The Federal vocational rehabilitation act was continued by Congress until June 30, 1933, with the appropriation for investigation and administration increased.

UNEMPLOYMENT

An outstanding measure looking toward the prevention of unemployment was the passage by Congress of an amendment directing the Bureau of Labor Statistics to collect and publish full and complete statistics on unemployment. Additional appropriations to carry on this work were, however, not allowed by Congress. Massachusetts continued its investigation of unemployment in the textile industry, and appropriated $5,000 to conduct an investigation of unemployment especially among workers over forty-five years of age. New Jersey also forbade discrimination against persons forty years of age or over, employed on public works. Porto Rico required a dismissal wage upon discharge without at least fifteen days' notice and established a branch employment service in New York City. To curb abuses of private employment agencies, Kentucky made the granting of licenses conditional upon good moral character and prohibited many abuses, such as misrepresentation and fee-splitting. Massachusetts penalized unlicensed seamen's intelligence offices. New York directed a scientific study of public employment offices. Utah appropriated an additional amount to the state building commission.

REGULATION OF HOURS OF WORK

Regulation of the hours of work was the subject of legislation in many states. To eliminate evasion of women's hour law, New York clarified its law. This state also limited work on grade crossings to eight hours a day, except in cases of extraordinary emergency. Massachusetts authorized one day of rest in eight for members of police departments, and New York included motion picture operators in its one-day-of-rest-in-seven law. Rhode Island authorized town councils to permit the sale of certain articles on Sunday, within certain hours and upon payment of a license fee of $50. Porto Rico banned work after 10 P.M. Saturday but allowed women over sixteen who have not worked during the day and are not pregnant to engage in night work in the canning industry, but not for more than eight hours a day or forty-eight a week. New Jersey authorized leaves of absence for disabled municipal and county employees. Louisiana limited hours of work for women in certain establishments to nine a day and fifty-four a week.

SAFETY AND HEALTH

Safety and health were also the subject of legislation in several states. New Jersey established a safety code for the construction industry and enacted a law regulating home work covering sanitary conditions, numbers employed, destruction of infectious goods and the prohibition of home work on infants' or dolls' clothing. New York brought the demolition of buildings under the labor law and required safety devices to be provided for window cleaners on public buildings. Porto Rico exempted fruit packing factories from the law requiring dispensaries in power-driven plants. Mississippi enacted a law regulating barbering.

MISCELLANEOUS

Injunctions.—An advance in injunction regulation was made when New York specified that injunctions may henceforth be granted only upon such notice as the court may direct.

Administration.—Progress in the field of administration was made by Porto Rico in a law specializing the Department of Labor and Agriculture to a much greater extent. Minor changes, such as increase in certain salaries, were made by three states, and Massachusetts created a division to study prices and businesses affecting the necessaries of life.

Other Acts.—Mechanics' lien laws were amended in New Jersey, New York and Virginia. Massachusetts directed an investigation of stock purchasing by certain employees, and Porto Rico imposed a penalty on employers who interfere with employees' right to vote.

LABOR IN POLITICS

By David J. Saposs

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JUDGE PARKER'S APPOINTMENT

Certain events made this an exciting year politically for labor. The appointment by President Hoover of Judge Parker to the United States Supreme Court unloosened a flood of opposition. Labor was particularly aroused because of a decision rendered by Judge Parker with reference to the "yellow dog" contract. This was one of the most drastic decisions upholding individual contracts between employers and workers in which the latter are required to agree not to join a union during the period of their employment. The Negroes were equally aroused because of allegedly derogatory remarks made by Judge Parker about them in a political campaign. In addition, the Progressives in the Senate encouraged by their fight on the Hughes appointment, continued their opposition to Judge Parker because of his conservatism. The part which organized labor played in securing the rejection of Judge Parker's appointment is further complicated by the fact that many Senators were undoubtedly swayed in their decision by the approaching election, and the outcome might have been different had not there been an election in the offing. At any rate, although the discussion of the Parker appointment had brought to the fore, the anti-injunction legislation which labor is demanding it was not successful in capitalizing this interest so as to secure favorable action by either House.

LABOR AND INDUSTRIAL DEPRESSION

The interest of labor in politics is always intensified during periods of depression, since industrial action is less effective. Besides, many problems assume importance which cannot as readily be coped with through industrial action. Unemployment is naturally one of these problems. Thus unemployment insurance, the shorter work day and work week are receiving much attention. Hence there is a keener interest in political action on the part of labor than there has been since the LaFollette presidential campaign in 1924. Nevertheless, even though the depression has already impressed itself upon the electorate, as the election returns indicated, it has not yet brought about a crystalization of new attitudes, which usually happens during long drawn out depressions, and which manifests itself in a lack of confidence in the two old parties on the part of a large number of voters. This development generally comes later and then labor becomes more interested in independent political action.

ELECTION RESULTS

However, the results of the last election have already shown a keener labor interest in both non-partisan and independent political action. Many of the Senators who favored the appointment of Judge Parker and were otherwise hostile to labor's legislative demands were defeated. On the other hand those who opposed the appointment and are usually friendly to labor's legislative demands were reelected. As has always been the case, it is difficult to exactly gauge the effect of the labor vote under the non-partisan plan. The last election was characterized by a wave of protest and naturally the Progressives stood to gain. Then, too, the so-called pro-labor candidates stressed in their campaigns their fight against the "public utility" interests, an issue upon which labor had neither a clear-cut opinion, nor did it express itself forcefully. And the Progressives attribute their victories to the public interest in this issue. Outstanding of the results in the last election is the credit which labor claims for defeating Senator Henry J. Allen, who favored the seating of Judge Parker. Organized labor in Kansas made a special campaign against Senator Allen and called attention to his record as the father of the Kansas Industrial Court Law. This law, as will be recalled, provided for compulsory arbitration of industrial disputes, which was especially distasteful to organized labor. In this case also there were other factors that contributed to Senator Allen's defeat and, therefore, complicate the situation. He was regarded as the Administration's spokesman, it was charged that he had been appointed under pressure, and he was unpopular with elements in his own party. Similarly, Senator Norris' overwhelming victory can hardly be more attributed to his labor record and labor support than to his outstanding position as the "tribune of the people" and his indomitable battle against the "public utility" interests. He and his supporters credit his victory to his general democratic record and his leadership of the fight against the "public utility" interests.

The elements that sponsor independent labor political action are also elated over their election successes. In their case the extent to which they were able to muster votes is easily measurable. While the complete returns for the country are not yet available it is evident from the scattered returns that the four independent labor parties—Socialist Labor, Communist, Socialist and Farmer-Labor—all made substantial gains. Since the previous vote of these parties was comparatively small their increases although proportionately high were not generally sufficient to enable them to elect many of their candidates. The Socialist Labor and Communist parties, representing the extreme wings, made the least headway. They did not succeed in electing any of their candidates, and not having elected any in the past they have no office holders to their credit. The two moderate groups—Socialist and Farmer-Labor parties—made the greatest headway and added to the number of public officials already elected under their party labels. Of their victories the most notable was the election of the Farmer-Labor Party candidates for Governor and Lieutenant-Governor in Minnesota. The members to the state legislature are elected on a non-partisan ballot and at this writing it is still uncertain how many are Farmer-Laborites. The one Farmer-Labor Party Congressman was reelected, and several of the other Congressional candidates lost out by a close margin. On the other hand their candidate for the United States Senate ran a poor third, with the contest being very close between the Republican and Democratic candidates. It is said that a deal was made between the Democrats and the Farmer-Laborites so that the former would support the candidate of the latter for Governor, and the latter would reciprocate by supporting the Democratic candidate for Senator. In Sheridan County, Montana a Farmer-Labor Party candidate was elected as a county commissioner.

The Socialist Party in addition to increasing its vote also added to its list of elected office holders. In Reading, Pa., two Socialists were elected to the state Assembly. In Milwaukee nine assemblymen were elected, whereas the Socialists had six in the previous session. The party also held its two seats in the State Senate. Its candidate for Sheriff was also elected. Two of its Congressional candidates lost out by small margins.

EMPLOYMENT

By Sumner H. Slichter

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EFFECTS OF THE BUSINESS DEPRESSION

Production and Employment.—The business boom of 1929 scarcely sufficed to halt the decline in factory employment which has been going on more or less continuously during the last decade. Although the physical volume of factory output in 1929 was about 41 per cent greater than in 1919, the number of factory employees was about 5 per cent below 1919. The business depression, which began in the summer of 1929, has carried factory employment almost to the low levels of 1921. Between September, 1929, and September, 1930, factory employment dropped about 20 per cent. In addition, a substantial number of the men who were on factory payrolls were working only part-time. This is reflected in the fact that the drop in factory output and in factory wage disbursements greatly exceeded the drop in factory employment. Between September, 1929, and September, 1930, factory output dropped 28 per cent and factory wage disbursements 28 per cent.

Building Trade and Public Utilities.—In the building industry the business recession began about a year earlier than in other branches of industry. This is reflected in the fact that contract awards in 1929 were about 14 per cent (in value) below 1928. There is a considerable lag, however, between contract awards and employment. Consequently, building employment remained good during most of 1929. Up to Oct. 17, 1930, contract awards were 18 per cent below the corresponding period of 1929. The drop was particularly pronounced in residential constructon which in 1929 accounted for more than one-third of all construction. Residential contracts dropped 44 per cent. On the other hand, contracts for public works and public utilities up to Oct. 17, 1930, exceeded the previous year. In 1929, they were $1,107,000,000 in 1930, $1,267,000,000. In part, this may have been due to the efforts of President Hoover and the U. S. Chamber of Commerce to stimulate public works. To a greater extent, however, it was probably due to the development of the public utility industry and particularly to the construction of long distance gas lines.

Railroads and Farms.—Railroad employment continued the drop which has been almost continuous since 1920. In September, 1930, railroads employed 1,485,906 persons or 15 per cent fewer than in September, 1929. The loss in farm population, which began about 1910, also continued throughout 1929. It is estimated that on Jan. 1, 1930, the farm population of the United States was 269,000 below Jan. 1, 1929, and about 4,850,000 below Jan. 1, 1910.

VOLUME OF UMEMPLOYMENT

Available Ratios.—Unfortunately it is not possible to give an accurate estimate of the volume of unemployment. The census of 1930 covered questions on employment but the complete census figures are not available at this time. The available figures show that on April 30, 1930, there were 2,508,501 who were able to work and who were looking for employment. This figure, however, does not include the many persons who had jobs but who were temporarily laid off without pay. It is expected that the census returns on the so-called "temporarily unemployed" will be published early in 1931. At the present time, only the figures for Delaware and the District of Columbia are available. In Delaware, the employees temporarily laid off without pay were about one-fourth as numerous as the workers who were unemployed and looking for jobs; in the District of Columbia they were one-fifth. These ratios may not be typical. In December, 1930, the volume of unemployment was probably over 1,000,000 above April.

Trade Unionists.—The percentage of trade unionists unemployed, according to the monthly reports received by the American Federation of Labor, was nearly double the percentage in 1929. The monthly averages for the first ten months of 1929 and 1930 were as follows:

	All trades	Building trades	Printing trades	Metal trades	other trades
January-October, 1919....	11.5%	24.8%	3.9%	6.6%	8.0%
January-October, 1930....	21.5	39.0	6.4	19.3	13.7

EFFORTS TO REDUCE UNEMPLOYMENT

National Business Survey Conference.—The depression of 1929-1930 has been notable for many important efforts that have been made to check the drop in employment by inducing business enterprises to avoid extreme and unnecessary curtailment of expenditures and by encouraging the expansion of public works. In December, 1929, under the leadership of the U. S. Chamber of Commerce there was organized the National Business Survey Conference. The Conference sought to encourage enterprises to make as many repairs, replacements, and improvements as they conservatively could and to avoid curtailing new construction. It had also sought to encourage residential building by helping to overcome the shortage of mortgage money. The Conference obtained the coöperation of many trade associations and chambers of commerce.

Some trade associations, such as the National Electrical Manufacturers Association and the International Association of Electragists, created committees to encourage manufacturers to repair worn machines and to supplent those that were obsolete.

State and City Committees.—Some states and many cities created committees of industrialists, labor leaders, and public officials for the purpose of stimulating employment and of spreading the available employment among a larger number of men. The organization in Ohio was perhaps the most comprehensive. A state committee on employment, consisting of the president and secretary of each of the folowing state organizations was appointed by the Governor: Ohio Manufacturers' Association, Ohio Bankers' Association, Ohio State Federation of Labor, Ohio Building Association League, Ohio Council of Retail Merchants, Ohio Farm Bureau Federation, Ohio State Grange, Ohio Newspaper Association, Ohio Chamber of Commerce. County committees representing the same nine organizations were appointed in each county. These committees endeavored (1) to stimulate private enterprises to provide as much employment as possible; (2) to speed up public construction. Some of these committees intend to continue as permanent bodies. A permanent committee (representative of business interests, the city, civic organizations, and labor organizations) has existed in Cincinnati for several years and has done valuable work during the present depression. The depression has led to the establishment of permanent stabilization committees in Baltimore, Indianapolis, and other cities.

THE PROBLEM OF BUSINESS EXPENDITURES

It is difficult to appraise the accomplishments of the National Business Survey Conference and the many state and local committees because many expenditures for construction, repairs, and replacement would have been made without the encouragement of the committees. In the field of public works some immediate relief was afforded by accelerating work on existing projects and some later relief by the authorization of new projects. But no one, of course, knows how much public construction was really expanded because of the efforts of the various employment committees. Moreover, it is an open question whether more harm than good was done by encouraging business enterprises not to postpone expenditures for repairs and replacements. In the winter of 1929-1930, nearly everyone believed that business would revive in the spring or the summer of 1930. When the revival did not occur, many enterprises found it necessary to curtail their expenditures on repairs and replacements. The railroads, for example, spent more on equipment and on the maintenance of roadways and structures during the first quarter of 1930 than in the first quarter of 1929, but when business failed to revive to the spring of 1930, the roads were unable to continue their large outlays. Many other enterprises also found it necessary to curtail expenditures in the summer of 1930. This general reduction in expenditures in conjunction with other factors, such as the continued drop in prices and the uncertain agricultural outlook, brought about a secondary reaction in the summer. Possibly the secondary reaction would have been less severe if business enterprises had conserved their resources earlier in the depression. However this may be, it seems clear that an important lesson to be learned from the depression of 1930 is that efforts to support markets in times of depression must be based upon accurate estimates of the duration of the depression and must be so timed that business concerns will not be compelled to reduce their spending before the revival of business sets in. At present, however, the technique of business forecasting does not enable us to estimate accurately the duration of depressions.

PERMANENT RELIEF MEASURES

The unemployment crisis of 1930 found the United States almost as ill-prepared to meet it as did the depressions of 1914 and 1921. Both the states and the Federal Government lack a permanent unemployment policy and a permanent organization for dealing with unemployment. An attempt to provide a policy and an organization is embodied in three bills introduced in Congress by Senator Wagner. One provides for the national collection of statistics concerning unemployment; a second provides for the forward planning of public works and creates a reserve of $150,000,000 for the prompt expansion of public construction in times of depression; the third provides for a nationwide system of public employment offices to be established jointly by the Federal Government and the states. It carries an appropriation of $4,000,000. All three bills passed the Senate. The first also passed the House and became law. The second passed the House in greatly modified form and, at the reconvening of Congress in December, was in conference. The third bill was vigorously opposed by the National Association of Manufacturers and did not come to a vote in the long sesison of the House.

UNEMPLOYMENT INSURANCE

The severe and prolonged unemployment has provoked discussion of unemployment insurance. The 1930 convention of the American Federation of Labor in Boston endorsed schemes of unemployment insurance controlled jointly by unions and employers. It declined, however, to endorse state unemployment insurance. Several state federations—including New York and Wisconsin—have endorsed state insurance. A notable event was the announcement by the General Electric Company of an unemployment insurance plan covering its employees.

MEDIATION AND ARBITRATION IN INDUSTRIAL DISPUTES

By Ethelbert Stewart

Commissioner of Labor Statistics, Department of Labor

MEDIATION AGENCIES

The principal Federal agencies concerned with mediation in industrial disputes are the United States Board of Mediation which is concerned solely with railroad labor, and the Conciliation Service of the United States Department of Labor. A number of States have mediation agencies, such as the Division of Mediation and Arbitration of the New York Department of Labor, and in Colorado a strike or lockout is illegal until the matter in dispute has been referred to the State Industrial Commission. All of the above agencies were active during 1930, but there were few cases of outstanding importance. A brief summary of the principal activities of these agencies during the year, and also of the principal industrial arbitration cases, follows.

RAILROAD LABOR MEDIATION AND ARBITRATION

Disputes. — The United States Board of Mediation was constituted under the terms of the Railroad Labor Act of 1926, to handle cases of dispute which the carriers and employees have been unable to settle in conference. When disputes between carriers and their employees cannot be settled through mediation proceedings, the law directs that the Board of Mediation shall endeavor to induce the parties to submit their controversy to arbitration. In case all these efforts fail, and the Board of Mediation believes the controversy may result in serious interruption of interstate commerce, the President of the United States may appoint an emergency board to make investigation and report to the President. There is, however, nothing savoring of compulsory arbitration in the act. Thus far, three emergency boards have been appointed.

Adjustments.—The Board began operations in July, 1926, since which time 540 cases involving rates of pay, rules and working conditions have been submitted. During this period the Board has also received 291 applications for its services in the adjustment of grievances other than rates of pay, rules, and working conditions. The fourth annual report of the Board covering the year July 1, 1929, to June 30, 1930, shows that in this period 65 cases involving rates of pay, rules and working conditions were acted upon. Of these, 25 were settled through mediation, 7 were submitted to arbitration, 18 were withdrawn through mediation, 2 were withdrawn without mediation consideration, and 13 were retired without mediation proceedings by action of the Board. At the end of the year covered by the report 3 of the 7 cases submitted to arbitration had been concluded. In the remaining 4 cases the interested parties had not met in an effort to agree upon the appointment of the remaining arbitrator or arbitrators. During the year 1929-30 the Board also received 222 applications for its services in the adjustment of grievances other than rates of pay, rules and working conditions. Of these 222 cases 120 were disposed of during the year, 9 of which were submitted to arbitration, involving two arbitration proceedings.

INDUSTRIAL MEDIATION

Federal.—The work of the Conciliation Service of the U. S. Department of Labor is that of mediation in labor disputes. It has been the general policy to respond promptly to any calls for the good offices of the representatives of the Conciliation Service from either employers, employees, or from the public affected by any individual dispute. In handling trade disputes representatives of the Service coöperate freely with State or local agencies or committees. The preliminary figures for the year 1929-30 show that about 557 cases were reported to the Service, affecting about 260,000 workers directly and about 132,500 indirectly. The total number of adjustments made by the Conciliation Service during the fiscal year ended June 30, 1930, was 411.

State.—The Industrial Commission of Colorado, created in 1915, is charged with certain duties as to arbitration and mediation. Requests for an increase in wages by several of the building trades were denied by the Commission due to the general depression. In one case the Commission found an employer guilty of violation of the Industrial Law of Colorado and instructed the chairman to request the District Attorney of the city and county of Denver to start such action against said employer as he thinks to be advisable.

INDUSTRIAL ARBITRATION

The Printing Unions.—Among various printing unions, arbitration as a method of settling disputes with their employers, has been long established. The dispute between the Milwaukee Newspaper Publishers and the Milwaukee Typographical Union No. 23, was settled by a local arbitration board. The dispute between the Photo-Engravers Union No. 13 and the Cincinnati Daily Newspaper Publishers Association was settled by the International Arbitration Board. In the dispute between the Chattanooga Typographical Union No. 89 and two Chattanooga newspapers, both the union and the newspaper publishers appealed from the decision of the local arbitrator, who had granted the request of the union for a decrease in the number of weekly hours, but had refused the request for an increase in the weekly wages. The International Arbitration Board refused the union's request for a reduction in the weekly hours, but granted the increase in wages, retroactive to Nov. 2, 1928.

Cleaners and Dyers Union.—Under the terms of an arbitration agreement entered into by the Chicago Master Cleaners and Dyers Association and the Cleaners, Dyers and Pressers Union, January, 1930 Dr. B. M. Squires was appointed impartial chairman with authority to hear and decide all issues submitted to him including any items in a proposed labor agreement on which the parties could not agree. In March, 1930, the union asked for the wages and conditions set forth in an agreement negotiated in 1928. Among other things the association asked for a ten per cent cut in the 1928 wage scale, the abolition of the guarantee of seven months' full time employment, and the elimination of the provision for unemployment insurance. The impartial chairman's decision reëstablished the minimum scale set forth in the 1928 agreement; abolished the guarantee of seven months' full time employment; and continued the provision for an unemployment insurance fund amounting to two per cent of the pay roll paid by each establishment and recommended that the union give early consideration to the matching by their members of the amount paid by the employers.

Hosiery Workers.—The national agreement between the Full Fashioned Hosiery Manufacturers of America and the American Federation of Full-Fashioned Hosiery Workers, effective Aug. 1, 1930, to Aug. 31, 1931, provides that all grievances not settled by the union and the association shall be referred to an impartial chairman for settlement. Dr. Paul Abelson of New York City was designated as impartial chairman to act throughout the term and continuance of the agreement. The decision of the impartial chairman shall be final.

INDUSTRIAL DISPUTES

The United States Bureau of Labor Statistics has compiled and published current statistics on industrial disputes in the United States since 1916. As there is no legal requirement for the reporting of strikes and lockouts, the Bureau must rely largely upon secondary sources for the initial reports of such disputes. Therefore, the figures of the Bureau are not to be regarded as absolutely complete, but it is believed that they do include all major disputes, and that the information obtained is sufficiently complete to furnish a comprehensive picture of strikes and lockouts in the United States. Disputes of less duration than one day or involving fewer than six workers are in all cases omitted from the compilations.

According to the reports of the Bureau, the number of disputes in 1930 was the smallest reported in any year since the work of compilation was begun in 1916. The preliminary figures for 1930 indicate a total of only 614 disputes, affecting 156,237 workers and involving the loss of 2,827,425 man days, as against 903 disputes, affecting 230,463 workers and involving 9,975,213 days of lost time in 1929. The downward trend in industrial disputes since 1916 is shown in the following table, which gives, for each year, the actual number of reported disputes and also the index number thereof.

Year	Total number reported	Relative number reported	Year	Total number reported	Relative number reported
1916	3,789	100	1924	1,249	33
1917	4,450	117	1925	1,301	34
1918	3,353	88	1926	1,035	27
1919	3,630	96	1927	734	19
1920	3,411	90	1928	629	17
1921	2,385	63	1929	903	24
1922	1,112	29	1930	[1] 614	16
1923	1,553	41			

[1] Includes figures for October, November and December subject to change.

CHILD LABOR

BY WILEY H. SWIFT

ACTING GENERAL SECRETARY, NATIONAL CHILD LABOR COMMITTEE

NEW LEGISLATION

Mississippi.—Of the nine state legislatures in regular session during 1930, only one—Mississippi—passed child labor legislation of primary importance. Mississippi passed an act lengthening the period of compulsory school attendance in cities with a population of 10,000 or more from 80 days to the entire term, and providing for approved part-time schools; and amended the child labor law so as to make it unlawful to employ any child between 14 and 16 years who has not complied, or is not complying, with the compulsory school law.

Other States.—Louisiana reduced the hours of work for women and for girls over 16 in most occupations from 10 hours a day and 60 hours a week to 9 hours a day and 54 hours a week; New Jersey appointed a Commission to study migratory child labor in that state. Defeated legislation included bills raising the minimum age for employment from 14 to 15 years in New York and Massachusetts, a revision of the New Jersey school code which would have advanced the educational requirement for children of 14 years leaving school for work from the sixth to the eighth grade; and a bill providing for extra compensation to minors injured while illegally employed in Rhode Island. The proposed child labor amendment to the Federal Constitution was considered in only one state—New York—where it died in committee, leaving the number of states (5) which have ratified it unchanged.

UNIFORM CHILD LABOR LAW

Age Limitation.—A new draft of the Uniform Child Labor law adopted at the 1930 meeting of the Conference of Commissioners on Uniform State Laws materially raises the standards originally set by that body in 1911 in most respects. The minimum age for any gainful employment except street trades is set at 14 years, but the definition of gainful employment still excludes agriculture, domestic service, and athletic games, thus leaving child beet workers, cotton pickers, houseworkers, nurse girls, golf caddies, etc., without any protective regulation.

Working Hours.—Regulations affecting hours and night work are extended to boys between 16 and 18 as well as to girls; work permits are required for children under 18 instead of under 16, and the minimum age for work in mines and quarries is raised from 16 to 18 years. A new clause provides that the combined hours of school and work for children working outside of school hours must not exceed 10 hours a day. The enumeration of dangerous occupations prohibited for minors under 16, 18, or 21 years is made more specific, but the omission of the clause giving the proper state body power to extend the list of prohibited occupations is a serious loss. The most backward step is a clause lowering the minimum age for newsboys from 12 to 9 years, exempting them from the badge requirement without which enforcement of the street trades law is impossible, and advancing the hour at which they may start work from 6 a. m. to 5 a. m.

CONFERENCES

Child Health and Protection.—Under Section III of the White House Conference—Education and Training—is a Committee on Vocational Guidance and Child Labor of which Anne S. Davis, of Chicago, is chairman. This committee has functioned through sub-committees which have compiled extensive reports on The Child Laborer in Non-Agricultural Occupations; The Child Laborer in Agriculture; Hazardous Occupations, Industrial Accidents, and Workmen's Compensation for Injured Minors; General Problems of Administration of Laws Affecting Child Labor; Standards of Wages for Juvenile Employment; Organizing the School System for Guidance, Mental Measurements, Counselling, Curriculum Guidance; Opportunities for Training; Occupational Studies and Placement; and Special Problems.

National Child Labor Committee Anniversary.—At a two-day conference, marking the twenty-fifth anniversary of the founding of the National Child Labor Committee, held in New York in December, 1929, child labor was considered in connection with educational advances, public health, vocational guidance and placement, the program of organized labor and social progress. Governor Roosevelt, of New York, delivered an address on the function of government in child protection and representatives of state child labor committees, and state departments of labor reported on the progress of child labor legislation in their respective states.

Interstate Migratory Conference.—Early in 1930 a two-day conference on the work and education of migratory child laborers was held in Baltimore, under the auspices of the Maryland League of Women Voters. The conference, attended by delegates from Delaware, Maryland, New Jersey and Pennsylvania, authorized the appointment of a joint legislative committee composed of four representatives from each of the four states, representing the state departments of labor and education, private welfare organizations, and interested employers. This committee was instructed to draft, for presentation at the 1931 sessions of the state legislatures, uniform legislation dealing with migratory child labor, including specific recommendations that canneries be brought under the state child labor laws and that provision for school attendance be made for migratory children.

NEW INVESTIGATIONS

California.—The Division of Vocational Education of the University of California in coöperation with the State Department of Education, made a study of factors accompanying early elimination from school in Oakland, Calif.

Georgia.—The National Consumers' League made an investigation of industrial accidents to minors under 18 in the State of Georgia.

Maryland.—The Commissioner of Labor and Statistics of Maryland published a study of one hundred educationally retarded applicants for special work permits; and surveys of child labor in canneries and in berry and vegetable fields of Maryland.

Washington. — The Washington State Board for Vocational Education made a special investigation of the part-time school and junior worker in Seattle.

New York and New Mexico.—Unpublished studies include an investigation by the New York Child Labor Committee of child labor in the scallop sheds on Long Island, and a study of child onion workers in Orange County, New York; also a study of children in the cotton fields of New Mexico by the State Bureau of Child Welfare.

Pending Studies.—Studies still in preparation include a study by the Federal Children's Bureau of workmen's compensation laws as they affect injured minors; and an analysis of the employment histories of minors attending continuation schools in Milwaukee, Wisconsin; a study by the National Child Labor Committee of the operation of the Bing Law (the compulsory school attendance law) in Ohio; a study of all industrial accidents to minors under 18 years occurring in Massachusetts during 1928 by the Massachusetts Child Labor Committee; a survey of migratory child workers on truck and small-fruit farms in New Jersey by the Migratory Child Survey Commission.

BIBLIOGRAPHY

General.—*The American Child* is a monthly publication of the National Child Labor Committee devoted entirely to child labor and related problems. Among the most important publications since the 1929 AMERICAN YEAR BOOK which deal with child labor in general are the following:

Federal Children's Bureau
Child Labor: Facts and Figures
Children in Fruit and Vegetable Canneries

National Child Labor Committee
Proceedings of the Twenty-fifth Anniversary Conference of the National Child Labor Committee Held in New York City, December 16-17, 1929
The Doctor Looks at Child Labor
Child Labor Programs and Projects
Child Labor Facts, 1930

Methodist Episcopal Church, South, Nashville, Tenn.
Education and Child Labor in the Southern States

Special State Reports include the following:

California
Pupils Who Leave School. University of California, Division of Vocational Education, Berkeley, California.

Colorado
Child Labor in Agriculture and Farm Life in the Arkansas Valley of Colorado. (Based upon studies made in 1924) Colorado College in coöperation with the National Child Labor Committee.

Georgia
Youth in Danger. By Marguerite Marsh, National Consumers' League.

Maryland
Berry and Vegetable Pickers in Maryland Fields; Child Labor in Vegetable Canneries
The Mentally and Educationally Retarded Child Laborer

Washington
Part-time School and Junior Workers in the City of Seattle. Washington State Board for Vocational Education, Olympia

WORKMEN'S COMPENSATION AND INSURANCE

BY JOHN B. ANDREWS

SECRETARY, AMERICAN ASSOCIATION FOR LABOR LEGISLATION

LEGISLATION

During 1930 Congress and the legislatures of nine states and two insular possessions met in regular legislative session. Four states and Porto Rico amended their workmen's compensation laws to effect improved operation and two of these states—New York and Virginia—adopted more noteworthy changes. Only four states—Arkansas, Florida, Mississippi and South Carolina—are without compensation laws. For the first time workmen's compensation was a leading issue in South Carolina and Mississippi where carefully considered bills were introduced with wide support but were defeated by certain special interests and damage suit lawyers. In Florida, where public institutes on the subject have been held in leading cities; Arkansas, where a representative state-wide committee on workmen's compensation has been organized; as well as in South Carolina—all of which meet in legislative session in 1931—increasing public interest indicates that efforts will be renewed to secure the adoption of the compensation principle at the coming session. A state-wide system of old age relief was established in Massachusetts and New York, and New Jersey created a commission to investigate pension laws and old age dependency and report its findings and recommendations to the 1931 legislature.

WORKMEN'S COMPENSATION

New York.—The occupational disease list was extended to include three additional diseases, but the deadly silicosis is still uncompensative in New York, further evidence of the need for the adoption of all-inclusive occupational diseases coverage which si now in successful operation in ten laws including the three Federal acts. Provision was made for awarding of compensation for neck disfigurement and the minimum weekly compensation for the loss of both eyes was raised from $8 to $15. Deposits of securities is now a mandatory condition of self-insurance.

Virginia.—The commission is empowered in extraordinary cases to require additional medical care for a period not to exceed 180 days. The per cent of wages payable as compensation was increased from 50 per cent to 55 per cent. The weekly maximum was raised from $12 to $13, the limit on total amount for total disability was raised from $4,500 to $5,600 and the amount allowable for burial expenses was raised from $100 to $150.

VOCATIONAL REHABILITATION

Congress continued the federal vocational rehabilitation act until June 30, 1933, and raised the minimum annual allotment of funds to any state to $10,000. The authorized appropriation of the Federal board for investigation and administration was also increased. The four states which have failed to enter into the coöperative plan for vocational education—Delaware, Kansas, Vermont and Washington—did not meet in regular legislative session in 1930.

OLD-AGE PENSIONS

Massachusetts. — Provision was made for the granting of assistance to deserving citizens 70 years of age or over who have resided in the state for at least 20 years, to be granted when practicable in the applicant's home. Bureaus of old-age assistance to administer the act are established within each board of public welfare, under the supervision of the state department of public welfare. Towns rendering assistance are to be reimbursed by the state for one-third of the assistance given, or if the beneficiary has no settlement within the state, for the total amount thereof. The commissioner of corporations and taxation was directed to consider ways of raising required revenue and report to the legislature.

New York.—A state-wide system of old age relief is established, and administered by city and county public welfare districts, or by cities electing to administer relief, under the supervision of the state department of social welfare. United States citizens 70 years of age and over who have been residents of the state for ten years immediately preceding application for relief and who fulfill certain other qualifications, are eligible to relief, the amount of which is determined by varying costs of living and may include medical care and nursing. Half of the amount expended for relief and travelling expenses of district welfare officials is borne by the state, together with half of other district expenses that may be allowed. Provision is made for periodic reconsideration of relief, and reports of public welfare officials to the state department are required. The sum of $60,000 was appropriated for the year ending June 30, 1931, for the increased expenses of the department of social welfare due to the division of old age security.

State Laws.—In addition to Massachusetts and New York, ten states and one territory have enacted old age pension laws: Alaska, California, Colorado, Kentucky, Maryland, Minnesota, Montana, Nevada, Utah, Wisconsin and Wyoming.

COGNATE SOCIETIES

American Assn. for Labor Legislation, 131 E. 23rd St., New York City.

American Federation of Labor, A. F. of L. Building, Washington, D. C.

American Federation of Musicians, 1440 Broadway, New York City.

Conference for Progressive Labor Action, 104 Fifth Ave., New York City.

Industrial Workers of the World, 90 E. 10th St., New York City.

International Assn. of Garment Manufacturers, 395 Broadway, New York City.

International Assn. of Machinists, 799 Broadway, New York City.

International Longshoremen's Assn., 500 W. 30th St., New York City.

INTERNATIONAL SEAMEN'S UNION OF AMERICA, 623 So. Wabash Ave., Chicago, Illinois.

JUNIOR ORDER OF UNITED AMERICAN MECHANICS, 121 No. Broad St., Philadelphia, Pa.

LABOR DEFENCE COUNCIL, 108 E. 14th St., New York City.

LEAGUE FOR INDEPENDENT POLITICAL ACTION, 52 Vanderbilt Ave., New York City.

LEAGUE FOR INDUSTRIAL DEMOCRACY, 70 Fifth Ave., New York.

MARINE ENGINEERS' ASSN., 119 Broad St., New York City.

MASTERS', MATES' AND PILOTS' ASSOCIATION, 119 Broad St., New York City.

NATIONAL ASSN. OF LETTER CARRIERS, A. F. of L. Building, Washington, D. C.

NATIONAL CIVIC FEDERATION, 1 Madison Ave., New York City.

NATIONAL FEDERATION OF POST OFFICE CLERKS, A. F. of L. Building, Washington, D. C.

NATIONAL INDUSTRIAL CONFERENCE BOARD, 247 Park Ave., New York City.

NATIONAL INDUSTRIAL COUNCIL, 11 W. 42nd St., New York City.

NEPTUNE ASSOCIATION OF MASTERS AND MATES OF OCEAN AND COASTWISE STEAM VESSELS, INC., 82 Broad St., New York City.

DIVISION XXVII

RELIGION AND RELIGIOUS ORGANIZATIONS

ANALYSIS OF THE LATEST U. S. RELIGIOUS CENSUS

By H. K. Carroll

General Statistician of the Churches

GENERAL

Scope of the Census.—The Institute of Social and Religious Research, C. Luther Fry, Editor, New York City, has made an analysis of the U. S. Census of the Churches for 1926, the latest religious census made, which shows many interesting facts that would not be known except by applying comparisons to the statistical statements. Among the questions answered are: "What proportion of Americans belong to the Church? To what denominations do they belong? How are they geographically distributed? How rapidly are churches growing? Is the Sunday School declining? To what extent are ministers academically trained? What is the value of church property? How much do churches spend?" Many other data are brought out. The census has many facilities for gathering information which do not fall to the lot of persons who lack some of the resources which the Government can command.

Adult Membership.—Figures are given to show the proportion of the adult membership on church rolls. It is estimated that those who are 13 years old and over are in the list of adult members, and that those who are under 13 years of age are not on the adult membership roll. This rule is applied for example to the Roman Catholic Church and its membership is set down at 13,300,000. The Directory of that church, however, reported for 1929 a total of 20,203,702, which practically covers Catholic population. Some, following a rule suggested for the Catholic prelates' census of 1890, estimated that 15 per cent should be taken off of the population to get a fair estimate of the Catholic communicant total.

CHURCH MEMBERSHIP ROLLS

Denominational Comparisons.—There are 212 denominations reported in the census of 1926, most of which are small in number of members. There are 50 which have fewer than 1,000 members and 48 with from 1,000 to 5,000. More than half of all the denominations have fewer than 7,000 members each. There are only two dozen denominations which have more than 200,000 adult members each, including 91 per cent of the total adult membership. The largest denomination is the Roman Catholic, with 13,300,000 adult members; the second largest denomination is the Methodist Episcopal with 3,700,000 adult members; the third is the Southern Baptist Convention, with 3,300,000 adult members. Fixing the adult membership of the Jewish denomination at 2,930,000, it is seen that its report of over 4,000,000 is practically equivalent to its population. Moreover, at the last census of the population of Canada nearly two and a half times as many people were reported to be affiliated with the Methodist Church as that denomination reported as attached to itself. The conclusion is drawn from conditions in the United States that more than half of the people of the United States 13 years of age and over are on the membership rolls of the church.

Other Denominations.—The two other denominations with more than

2,000,000 adult members are the Negro Baptists and the Methodist Episcopal Church South, while the Presbyterian Church in the U. S. A., the Protestant Episcopal Church, the Disciples of Christ, an d the Northern Baptist Convention have 1,000,000 to 2,000,000. The United Lutheran Church, the Congregational-Christian Church, have roughly, 900,000 and 860,000 respectively. The Negro Baptist Church has 2,914,000 adult members (this body has two or three inclusive bodies). Then come groups or families of churches: Methodist, with 7,860,000 adult members, Baptist with 7,237,000 adult members, and Presbyterian with 2,582,000 adult members. The South has the chief groups of Protestants; there being nine out of ten states which are Protestant.

Ratio of Men and Women.—It is a general idea that many more women than men are on the membership rolls of the church. The census has answers for this question, showing that according to the returns of the churches there are 125 female members to every 100 male members, and yet the total number of men living in the United States is greater than the number of women. The census of 1920 returned 104 males to every 100 females. On the reasonable assumption that the ratio of men to women, says Mr. Fry, was the same in 1926 as in 1920, it follows that 48 per cent of the men are church members, contrasted with 63 per cent of the women. This tends to bear out the contention that churches have a much greater hold on women than on men. This fact obtains among Negro churches where Negro women are particularly attracted to the churches. It is interesting to observe that Negro men not only show a lower rate than Negro women, but a lower rate also than white women. This seems to indicate that the church has a less extensive hold on Negro men.

Sectional Comparisons.—As to the proportion of the adult population in church in different sections the returns show that it is comparatively high in the southern and eastern states and considerably lower in the far west. Most states in the west have comparatively few church members. In Kentucky, Tennessee, Alabama and Mississippi nearly three-fourths of the women are church members, but only about half of the men. It is found that where the suicide rate is high the rate of church membership tends to be low. This remarkable fact is interpreted as tending to show that the status of the church is closely related to fundamental social conditions.

URBAN AND RURAL CHURCHES

The number of people who belong to church is ascertained by eliminating the children from the adult population. For example, the total population in 1926 was placed at 117,000,000. The census reckons that persons below 13 years of age are children. Eliminating the children from the 117,000,000 total population the adult population was reckoned at 80,000,000 in 1926. The persons 13 years and over are the number which are on church rolls, which means that 55 out of each 100 adults are on church rolls. Rules are also given by which it is possible to separate rural from urban churches, but calling upon pastors, when they make returns, to make the separation between urban and rural churches. The census of 1926 tabulated for the first time separate returns for urban and rural churches, and these returns show that 52 per cent of the church population belongs to the rural section compared with 58 per cent in urban section. The returns also show that the Jewish and the Church of Christ, Scientist, are most highly urban. In both cases both denominations have more than 94 per cent of all their churches in urban communities. Protestant Episcopal and Roman Catholic churches are also largely urban, with more than 80 per cent of their adult members in cities. The Methodist Episcopal Church, South, and the Southern Baptist Convention, have 64 per cent and 73 per cent respectively in rural churches. Moreover, it is a fact that the rural population is far more dominantly Protestant than is the urban.

THE SUNDAY SCHOOL

Are Sunday schools declining? This question, it is said, is not as fully answered as is desirable but the answers given do furnish a basis for "drawing important conclusions." Denominational schools were reported by 185,000 churches, or nearly four-fifths of the total numbers. Only 16 small denominations made no reports on Sunday schools. The great majority of Sunday schools are found in rural areas, which is explained by the fact that larger number of churches are found in rural sections. With four exceptions all of the larger denominations reported at least four-fifths of their churches had schools. Sunday schools, it is said, are more numerous now than they were a generation ago. In 1926 the number of scholars in church schools was somewhat beyond 21,000,000. The same year the public school enrollment was 24,740,000. The increase in the number of pupils in church schools was decidedly less rapid between 1916 and 1926 than during 1906 to 1916.

NEGRO CHURCHES

There are in all 24 denominations which are entirely Negro. Of these the largest is the Negro Baptist which has 2,914,000 adult members. The African Methodist Episcopal Church has 487,000 adult members and the African Methodist Episcopal Zion Church, 397,000; the Colored Methodist Episcopal Church, which separated from the Methodist Episcopal Church, South. These four bodies include 85 per cent of all adult members of the Negro Baptist Churches. The Methodist Episcopal Church, the oldest of the Methodist Episcopal group, has a number of Negro Churches, with a population of 303,000 adult members. Formerly the white and Negro members had been members of the General Conference for many years. Now for a long period they have been members of Annual Conferences, but gradually they began to draw apart, the Negroes forming Negro Conferences, and the whites separating to form White Conferences. The Bishops presided indiscriminately over White and Negro Conferences, until the Whites indicated a preference for separate Conferences of their own. In the process of separation on the color line the General Conference decided that it was only fair that Negroes should be elected for bishops of Negro Conferences, and since then it has been left somewhat a matter of choice as to whether the Negro bishops should hold only Negro Conferences or whether by request or mutual arrangement bishops of either color should hold conferences, when convenient of their own or the other color. The Colored Conferences have prospered under the present arrangement and it seems mutually satisfactory.

PROTESTANT DENOMINATIONAL ACTIVITIES

By H. K. Carroll

General Statistician of the Churches

THE ANGLICAN COMMUNION

Lambeth Decennial Conference.—The Conference, composed of bishops of the Anglican Communion throughout the world, held its seventh decennial meeting in London in July, 1930, under the presidency of the Archbishop of Canterbury. There were sessions from July 7 to July 18, and from July 28 to Aug. 9, the interval being devoted to meetings of committees appointed to consider the subjects discussed by the Conference. The opening session began with 310 archbishops and bishops belonging to the Anglican communion. The Conference, embracing bishops from all parts of the world, with many millions of communicants in bodies with state connections as the Church of England, may be regarded as one of the most distinguished within the bounds of the Protestant world. Present at the Conference were a number of representatives of the Oriental Orthodox Church, including the Patriarch of Alexandria, who sat with Archbishop Lang on his throne, and also old Catholic organizations of Switzerland and other countries of Europe. The Archbishop of York preached the opening sermon, Archbishop Lang presiding at all the sessions of the Conference.

Conference Program.—There was a carefully prepared program, which was taken up in order for discussion and submitted to committees, one topic to each of the six committees. The first topic was the Christian Doctrine of God, (a) in relation to modern thought; (b) in relation to non-Christian religions and ideals; (c) as determining the character of Christian worship; (d) to be realized throughout the church by teaching and study. A day was given to this comprehensive subject and then it was referred to the appropriate committee. The second topic taken up the second day was, the Life and Witness of the Christian Community, individual and corporate, in the fulfillment of the divine purpose, with special reference to marriage and sex. There were six main subjects in the program and six committees to prepare reports which the Conference passed upon when they were received and after full consideration adopted as the action of the Conference.

Birth Control.—The second topic on marriage and sex brought into consideration the attitude of the church of today, not only on the question of marriage and divorce, but also the modern thought on the matter of "birth control." Whether so delicate a subject, involving in the view of many the matter of morals, would have been brought into the general Episcopal Convention in this country no one could say, but the Lambeth Conference not only put it in its program but discussed it freely and gave expression to its own views in such a way as to draw world-wide attention to the subject. The report of the Conference is given in the form of resolutions, those, it is presumed which the committees formulated and submitted to the Conference. That pertaining to birth control reads as follows:

"WHEREAS, there is a clearly felt moral obligation to limit or avoid parenthood, the method must be decided on Christian principles. The primary and obvious method is complete abstinence from intercourse (as far as may be necessary) in a life of discipline and self-control, lived in the power of the Holy Spirit. Nevertheless, in those cases where there is such a clearly felt moral obligation to limit or avoid parenthood and where there is a morally sound reason for avoiding complete abstinence, the Conference agrees that other methods may be used, that this is done in the light of some Christian principles. The Conference records its strong condemnation of the use of any methods of conception-control from motives of luxury or mere convenience."

The discussion which has taken place since the Encyclical has been published with these and similar paragraphs, has been widely divergent. The opposition is couched in severe terms. Some of it comes from bishops and declares their purpose to do their utmost against it. The vote in the Conference carried more than a third against it, 193 to 67.

The Encyclical notes that belief in God has weakened and that the sense of sin, unfortunately, has lessened. It pays a tribute to science as having become more favorable to Christian theism.

Christian Unity in South India.—The Unity of the Church received much attention from the Conference, and its attitude toward the question of Christian Unity in South India between representatives of the various bodies in negotiation for the formation of one Christian body of Presbyterians, Methodists, Anglicans and others was much more favorable than in former years. The outlook is promising for a union which will include three or four Anglican bishops and a plan which will recognize the ministry of other churches and bring about a successful body of coöperative ministers throughout all of South India.

Anglican - Oriental Orthodox Union.—Representatives of the hierarchy of the Eastern Church present at the Conference spoke of the purpose of having a conference next year at Athens of the Oriental Orthodox Church which they hoped would consider the question of union with the Anglican Church. This was one of the subjects, it was announced, which would be taken up at that time.

Youth and the Church.—The last subject dealt with by the Conference was that of youth and its vocation. It seems to find barriers between youth and the church and believes they are due to being engrossed in science, art, music, literature, recreation, sport and friendship, and look upon the church as too largely occupied with dogmatic and ecclesiastical questions, not observing that the relegion of Christ, though transcendant, mysterious, supernatural, is also simple, human, lonely, having before it the whole rock range of man's thought and activity. The Encyclical calls upon the older members to study this question and the aloofness of the young people and endeavor to reach the hearts and minds of the newer generation.

Continuation Committee of the World Conference.—The Christian World Conference, the greatest assemblage in the history of Protestantism, was held in Lausanne, Switzerland, three years ago, but it has not been allowed to pass into forgetfulness. Every year, in the summer season, it is called to remembrance by the meeting of the Continuation Committee created by order of the Conference itself, which left a report of what the Conference did and what it hoped might be accomplished in the years to come, before the second World Conference should be called to consider plans for the promotion of the unity with the movement begun years ago by the Protestant Episcopal Church. The Continuation Committee held its latest meeting in August, 1930, at Lausanne, and among the subjects considered was the proposition looking to the second World Conference to be held in 1937; the organization of Christian Student Movement, representing the youth of eleven countries; important addresses by the Bishop of Albany, interpreting the recent Lambeth Conference; address by General Superintendent Zollner on the conception of the Church and its Unity, and the plans of the Theological Commission. The President, the Archbishop of York, presided. Among others present were Archbishop Germanos Thyatira of the Orthodox Greek Church, Pastor Monord, French Protestant; Dr. Deissmann, the great German leader; and others. Dr. Deissmann submitted eight theses constituting a plan of campaign to attain the end sought by the World Movement. The program for next year is to deal with the "Church in the Purpose of God." One of the results of the movement is the preparation by a Commission created by the Methodist Episcopal Church of a report, giving its views on the Preamble and Report issued by the World Conference of 1927, in which it is declared that that document met the warm approval of that great body. The presentation of such statements is one of the features of the Continuation Committee at its annual sessions which, in return, sends to the churches its own actions and recommendations.

Catholic Congresses.—The Catholic organizations belonging to the Anglican Communion hold their meetings both in the United States and in England. The one in England met in London and received a greeting from the Archbishop of Canterbury as a loyal body of members of the Anglican Communion. The Bishop of Nassau, West Indies, presided, but no English bishop, it is said, attended it. The Catholic Congress of the United States was held in November in Buffalo. It was attended by nearly 1,200 members. Several bishops were present and took part in the proceedings. A solemn High Mass was celebrated. One of the papers presented was on "The Seven Sacraments."

Among the bishops who are known as Catholic is Bishop Manning of New York. Recently thirteen Episcopal clergymen of New York, including Dr. W. Russell Bowie of Grace Church, Dr. Karl Reiland of St. George's, Prof. Howard Chandler Robbins of the General Theological Seminary, and others issued a statement in which they said that they share the reverence held in our Communion for our "Catholic heritage," interpreting it "as an unbroken fellowship in history and spirit with all the age-long faith and worship of the Church since its beginning." But they added that they also highly honor the connection of the Church "with that spiritual re-birth which is known as Protestantism," and "we are not willing to see this church separated in word or work from its Protestant affiliations." They call attention to the fact that the Church is known as the "Protestant Episcopal Church in the United States of America" and ministers are asked at their ordination "to promise obedience and conformity to the doctrine, discipline and worship of the Protestant Episcopal Church."

THE BAPTIST COMMUNION

Southern Baptist Convention.—This body in its world-wide distribution has many branches, knit together in the various continents and indicating increase wherever they have been organized. In the United States there are three considerable bodies of white communicants, known as the Northern and Southern Conventions and the American Baptist Association, recently formed, and two or three organizations of colored communicants, called National Conventions. The Southern Baptist Convention, the largest body with upward of 3,770,000 communicants, held its last annual convention in New Orleans, receiving reports of its foreign and home missions, educational, evangelistic and other work. It took strenuous action against attempts to break down the laws against prohibition. It declared with unanimity that there could be no neutral ground between Prohibition and anti-Prohibition. The forces of sobriety and orderly government, it said, would fight to the utmost against the forces of liquor and lawlessness. We are not concerned, they added, about politics, stating "we will declare our intention and purpose not to vote for any nominee for President, U. S. Senator, Governor or candidate for high position, who is hostile to the present prohibition laws, no matter what party label he may wear." On the question of a national referendum, the Convention declared the highest expression of states' rights has already been obtained in the Eighteenth Amendment and it promises that "the liquor traffic shall be banished forever from this republic."

Union in China.—The greatest advance ever undertaken between the Southern Baptist and Northern Baptist Conventions is reported in China. Both these bodies, until 1930, had carried on missionary work in China separately. Now they have come together and formed "The China Alliance" and have adopted a new and progressive program purposing to extend their missionary territory to Thibet and to far West China. Delegates were present from Canton, Swatou, Hakka, Kaingsu and Chekiang. The Rev. Dr. C. T. Ban, Secretary, a native minister, addressed the Northern Baptist Convention, in 1930, in Detroit and attended the Baptist World Alliance at Toronto, Canada, and received from the Baptist University there the degree of D.D.

Colored Baptists.—The National Baptist Conventions, African, which are divided, do not make full returns for all the states, but are estimated to have nearly 3,500,000 communicants. Many of them in recent years have moved from the South to large cities in the North and are establishing strong churches in New York, Philadelphia, Chicago, and other centers of population. They have steadier work, get larger incomes and state that they have better treatment than they used to receive in the South.

Riverside Baptist Church.—This great structure, one of the largest, most attractive and most costly of all churches in New York except the Cathedral of St. John the Divine, was finished, after having been badly damaged by fire, and services have been held in it since October, 1930. It is the successor of four Baptist Churches, the first in Norfolk Street in 1931, and three other notable churches in other sections of the city, with eminent pastors. It stands at Riverside Drive and 122nd Street, a great gothic structure, with one of the finest towers of commanding appearance, and so arranged that ten of its stories accommodate a capacious Sunday School, from the primary department to the adult classes, all below the carrillon, containing the largest bell in the world. The cost of the impressive structure, which must have been enormous, has not been named, and probably will not be named. It is ample for all who wish to hear its distinguished pastor, Dr. Harry Emerson Fosdick, who rose to eminence as a supply of a Presbyterian Church, but returned to a Baptist Church of very liberal principles, where he is known to his country and to the world.

THE CONGREGATIONAL COMMUNION

Bishops' Meeting at Canterbury.—Congregationalists are not so close in their ecclesiastical relations, perhaps, as most other Christian bodies, but though they are widely scattered over the earth, they have no more trouble, apparently, in getting together in world conferences than the great Anglican body, or the Presbyterian, or Methodist Churches with their highly organized systems.

While the International Congregational Council was holding its world session in Bournemouth, a body as different as possible in form of organization and system of denominational action and procedure was in session in Canterbury taking into consideration the interests with which it is concerned in every quarter of the globe. It was meeting by itself as a body of bishops, with no pastors or any lower order of ministry present, either to speak, or act, or vote, and no layman or laywoman was to be seen or heard. It sat by itself with a program prepared, not for it, but by it, with no particular set of men to whom they must acknowledge obligation, or responsibility as to the performance of their duties. It was a body of supreme authority with nobody to interrupt its proceedings or call it to account. They understood they were consecrated to the highest ecclesiastical office for the purpose of leadership in a church possessing great interests and with a vast work to be done.

The International Congregational Conference was composed of ministers, laymen, men and women who were present to use their ability in freedom, to consider how they might best speak and act so as to be of the greatest help to a body of churches widely scattered and needing advice and instruction and persuasion to take up the duties. Those going from America to attend this meeting at Bournemouth had an opportunity on the trip across to hold during the six days' passage a sort of seminary, designed primarily for the ministry, but welcoming men and women to the discussions. Theology, as the queen of the sciences, furnished topics of interest and instruction. The outcome as given by the chairman, Dr. Warren S. Archibald, of Hartford, was a statement of belief in six articles, both instructive and interesting. The Convention at Bournemouth had as its center "religion as primarily a way of life" and gave much attention to education. Of course thousands gathered in the convention were able to hear by the amplifiers in use. Fred B. Smith, a widely known layman, who is the moderator of the National Congregational Council of the United States, attended and speaks in high terms of the Conference. Mr. Smith found it had its unmistakable values and believes it will abide for many years in the life of the Congregational churches throughout the world. It accented "an unhesitating, profound conviction in the realities of our religion and in that broad interpretation which is characteristic of the Congregational churches. They showed their comprehensiveness on the questions of temperance, their attitude on the organized liquor traffic, on employment, economic problems, and unity and world peace, upon which there were ringing declarations. The Americans were greatly impressed with the deep spiritual emphasis given by the delegates and speakers from the British Isles. All the way through the International Council Mr. Smith felt a tremendous contribution was being made to the cause of international good will, peace and brotherhood throughout the world. A specific plan is now being developed according to President Smith, by which an *ad interim* Committee, through the leadership of Moderator J. D. Jones will carry on a ten-year program inspiring the churches throughout the world.

Congregational-Christian Church Union.—It will be remembered that in 1929 there was a union carried into operation between the Congregational churches of the United States and Christian churches which sprang out of three small bodies in the beginning of the Nineteenth Century, known as the Christian churches. The membership of these two bodies, which are happily one, now numbers 1,052,925, a net increase of 8,110 over the combined memberships of the two denominations before their merger took place. The young people's organization reports 161,039 members. The total value of the church buildings and sites and parsonages is $195,864,939, an increase of $9,212,183. The total of churches is 6,560. The next meeting of the new Congregational-Christian Council will be held in Seattle next July.

THE DISCIPLES OF CHRIST

With the celebration of the Pentecost of 1930 inaugurated in Rome, when the Church of Christ was begun, the Disciples held a great International Convention in Washington, D. C., in October last. It was held in the new National Church, built at a cost of $1,750,000, contributed by more than 3,200 churches and 45,000 individual donors. R. A. Long, of Kansas City, Mo., delivered the address at the dedication. The missionary work of the denomination has spread to many countries, is prosperous and adds greatly to the membership of the church. One of the events of the Convention was the launching of a movement to raise $8,000,000 as a pension fund. The date fixed for the completion of the fund was Nov. 16, and 100,000 workers were appointed and 250,000 pledgers enlisted. President Hoover sent his congratulations to the Convention and received its officers at the White House.

THE LUTHERAN COMMUNION

Membership.—Of the various communions known as Protestant, the largest in membership and the most widespread, having representation in all the continents, is the Lutheran. Counting its baptized persons with those who are communicants, the estimated total belonging to the Communion is about 82,000,000. The number of Lutheran communicants in the United States, lists not including the baptized, according to returns for 1929, is 2,777,617.

Union.—In the last 18 years or so a notable movement toward union of the various Lutheran organizations has been taking place: first, a general body was formed composed of synods using the Norwegian language, called the Norwegian Lutheran Church of America; second, three general bodies, known as the general synod (the oldest), the United Synod, South, and the General Council (the largest), formed the United Lutheran Church, a compact and effective organization, which has prospered and grown in numbers and in brotherly relations. In 1930 preparations for other unions, begun in 1929, ripened rapidly and there was an outcome in results never exceeded. Three notable synods, known as the Joint Ohio, the Iowa and the Buffalo, which had been discussing the question of union, met together and agreed to form an organic compact organization to be known as the American Lutheran Church. A few months later this church uniting with representatives of the Norwegian Lutheran Church, the United Danish Lutheran Church, the large Augustana Synod, and the Lutheran Free Church agreed to a further step forward organizing and adopting the name of the American

Lutheran Conference, which is a coöperative federation. All these bodies are to be members of the National Council which has long had an organization and an office in New York City and which has been active in the work of publicity, issuing several editions of the *Lutheran World Almanac,* the most notable statistical publication under the Lutheran name in any country. Under its leadership, besides its statistical work unsurpassed, if not unequalled, its Executive Committee has formed part of an executive committee under whose auspices two Lutheran world conferences have been held and advice and assistance has been given to Lutheran bodies needing them in Russia and other countries in Europe and also to foreign missions in Asiatic and other lands.

Synodical Conference. — Besides the groups coöperative with the National Council, of which the United Lutheran Church has been constantly in front in efficient leadership, there is one more known as the Synodical Conference. This is not related to the other bodies that constitute the National Council, but has its center in the Joint Synods of Missouri and Wisconsin and other bodies. It has differed somewhat in doctrine from other Lutherans, giving formerly an interpretation to the doctrine of predestination differing from that usually held among Lutherans and also holding itself aloof in pulpit fellowship from other Lutherans.

Marriage and Divorce. — The United Lutheran Church at its biennial Convention in Milwaukee took action on the question of marriage and divorce, holding that "misconduct and malicious desertion" are the only scriptural grounds for divorce and that when marriage is dissolved by other than "normal termination by the death of either party" the will of God is frustrated. It also provides that the innocent party in a divorce for misconduct and desertion is free to marry again a year after the divorce has been granted.

Prohibition.—The convention indicated its opinion that the laws based on the Eighteenth Amendment to the Constitution of the United States ought to be enforced.

Archbishop Sodorbloom.—Archbishop Nathan Sodorbloom, of Upsala, Sweden, Primate of the Lutheran Church of Sweden, has received for his activity in the world-wide movement to bring together various divisions of Christianity into union with one another, the Nobel Peace Award for 1930. He is not only primate in Sweden of the Lutheran Church in connection with his Archepiscopal dignity, but is also Chancellor of the University of Upsala. He was born in Helsingfors, Sweden, in 1866, and was educated at Helsingfors. He first became rector of the Swedish Church in Paris and then served as a professor in Upsala, becoming widely acquainted with English and American ministers and with other distinguished men of many denominations besides his own in his subsequent activities. The more widely he became known the more determined he was that a great work was needed to be done in promoting closer relations between various Protestant Churches which might be persuaded to form relations for the broadening of Christian unity and brotherly affection. After the Lambeth Conference of 1908 he formed a Christian Conference in Stockholm and also had a leading part in the Conference of Faith and Order held in 1927 at Lausanne, Switzerland. He explained at the great gathering at Lausanne that "we do not demand conformity in doctrine," but we do think it necessary to draw closer to one another just as the soul and body are knit together that they may show there is power of service in Christian unity. Archbishop Sodorbloom is author of many helpful works and has a wide influence in Europe and America.

Dr. Moorehead.—In connection with the award to the primate of the Lutheran Church in Sweden of the Nobel Peace prize the King of Denmark has conferred upon the Rev. Dr. John A. Moorehead, President of the Executive Committee for Continuation Work of the Lutheran World Conference, Knighthood in the

Order of Kannebrog. Dr. Moorehead has been thus honored for his work in relief of suffering in Europe, in the years after the World War, when he was Commissioner of the National Lutheran Council, 39 East 35th Street, New York City.

THE METHODIST COMMUNION

General Conference of the Methodist Episcopal Church South.—This body held its regular quadrennial Conference in May, 1930, in Dallas, Tex. One of the pending questions was that of providing a Judicial Council to which constitutional questions may be referred for decision. It has been the subject of discussion for some years and at the Dallas meeting a report was made by the Commission on the Constitution which provided for a Judicial Council composed of one bishop, three itinerant elders and three laymen. The Commission reported also a form of constitution which was rejected. After several amendments had been voted down, including the first named proposal, an amended report was adopted providing for a Judicial Council of five itinerant elders and four lay members, the bishops to nominate five times as many of each class and the General Conference to elect five itinerant members and four lay members and as many more as alternates. The term of office of the Judicial Council shall be for eight years. Another question of a constitutional order was the extension of clerical rights to women. The vote in the General Conference fell short of the constitutional requirement and so the women were not admitted to ministerial rights. Three new bishops were elected and consecrated: Rev. Arthur J. Moore, Rev. Paul B. Kern, and Rev. A. Frank Smith.

The question of union with the Methodist Episcopal Church, which failed some years ago and was postponed in the intervening quadrennial, did not come up in either of the last two General Conferences, but did receive attention in the Conference recently, which provided for the appointment of a committee of fifteen members on Interdenominational Relations, this Commission being empowered to represent the Church on all questions of fraternity with other Christian bodies and especially to cultivate the spirit of fraternity with the Methodist Episcopal Church "looking toward ultimate union of the two leading branches of Episcopal Methodism." The Commission is empowered, meantime, to effect any change of territory which may eliminate needless waste and competition between the two bodies.

The Methodist Church of Mexico.—This is a new organization in the Methodist Communion. It was formed in May last in the City of Mexico by authority of the Methodist Episcopal Church and the Methodist Episcopal Church South, which had conducted missions separately from the first. A joint committee of the two churches and members of the two annual conferences in that republic took part in the work of organization, including Bishop McConnell of New York and Bishops Candler and Hay of the Church South. The new body, which is autonomous, has its own General Conference, its constitution, discipline and everything that is necessary for a self-governing body. The Methodist Episcopal mission was begun in 1873 and that of the Southern Church in 1886; the former has 10,554 members and the latter, 4,483; and the two, with adherents, have a total of 26,037. After the Church was organized its first General Conference met at once to elect a bishop. Following the rules of the Methodist Episcopal Church and Methodist Episcopal Church South, it undertook to elect by a two-thirds vote. This was in vain, and the rule was changed to a majority vote. Success was the immediate result, the Rev. John Nicanor Pascoe receiving a majority of ten votes over Rev. V. D. Boez. The voting was open and free and any one who desired could count the ballots. Bishop Pascoe was the son of an Englishman, though born in Mexico. Only Mexican-born ministers may, under the Mexican law, become pastors in that country.

Response of Methodism to the Continuation Committee of the

World Conference.—It will be remembered that the great Christian World Conference of Faith and Order, in Lausanne, Switzerland, in 1927, instituted by the Protestant Episcopal Church, drew together the larger Evangelical Churches and also representatives of the Oriental Christian Church. It did not, however, formulate any plan of Church Union, but submitted to the various representative bodies a report which a Continuation Committee has brought to the attention of the Churches which were in attendance at the Conference. That this great movement has not been forgotten is made evident by a response which was issued in 1930 by a Commission ordered by the General Conference of the Methodist Episcopal Church which met in 1928. This document states the attitude of its Church on the Preamble and statement of the Continuation Committee as one of hearty approval and holds that one of the greatest needs of the Kingdom of God is a spiritually United Church for which Christ prayed "they may be one of us." The Methodist Commission concurs also in the importance of the Gospel as the Church's message to the world, and also in the statement that the true Church is not a mechanical organization, but a spiritual communion. Creeds and confessions, it agrees, are of great value, but must be grounded in the Scriptures and interpreted by the Spirit of God, and the five statements as to the ministry of the Church, the sacraments and the unity of Christendom are accepted, they aver, by the Methodist Episcopal Church. In conclusion the Commission pledges its heartiest support and coöperation and those of its Church to the Continuation Committee of the World Conference of Faith and Order in carrying forward its great task. This body meets yearly in Lausanne to keep in touch with the Churches which were represented in the World Conference in 1927, and is composed of distinguished men from America, Great Britain, Germany and other countries.

Foreign Missions of the Methodist Episcopal Church.—There are, it is officially reported, 893,881 persons on the constituency roll of the Church in its foreign fields. Of these, 675,116 are members of the Church in full and 218,765 are baptized children in preparation for membership. The largest constituency is in India where 517,780 persons are on the roll, largely from the outcast and low caste groups of Hindu society. In recent years larger numbers of high castes and educated classes and Mohammedans are being received. In China there is a constituency of 83,241, which list includes leaders of government, agriculture, business and the professions. The Japan Church, independent, reports 33,819 members; the Philippine Islands has 54,157, and the Malay Peninsula and Sumatra an additional 12,373. In Europe there are 118,387 persons in the Methodist Churches. In the churches over the seas there are 3,254 ordained native preachers and 2,596 nationals who are unordained. In Africa there are 767 African pastors and in China 1,171 pastors.

Decrease in Members and Contributions for Benevolences.—In the past several years the foreign missions of the Methodist Episcopal Church have suffered for lack of support, due to the annual decrease of the income of the World Service Commission which undertakes to collect for home and foreign missions and various benevolent societies. Ten years ago the sum raised for World Service was $15,756,000. In 1930 it shrank to less than half of that sum. Accompanying the decrease in 1929 of contributions for foreign missions is the very unusual decrease in the membership of the Church for the territory including the United States. It was noted that of all the areas in the United States there were only three that returned an increase. Whether there had been a decrease in membership in 1930 was not known before the end of the year; but there was the announceed decrease in World Service income at the end of the financial year, October, 1930, to $7,010,983, the falling off reaching $595,617. At the meeting of the Board of Foreign Missions in New York City at the end of November a deficit was declared of $300,000, creating difficult problems in the foreign fields. One of the solutions is a proposition to arrange to consolidate some of the missions with those of other denominations. The mission in France, which has done little in direct work in the conduct of missions, is to be abandoned. An interesting report was presented by the medical head of the medical mission in Eastern Liberia. The work is so carefully and economically conducted that many cases are treated at an outlay of only 25 cents, and the mission is virtually self-supporting.

The Board of Foreign Missions at its recent meeting at the end of November, after a long, careful discussion came to the conclusion that the wisest action to take was to concentrate on fewer fields. "Ever since World Service receipts began to dwindle, the Board, it was said, has tried to meet the situation, year by year, with horizontal cuts, reducing appropriations to every field, by substantially the same amounts, but this policy often repeated has sliced the appropriations, we are told, in several fields so thin that further reduction was not possible. Now a series of recommendations involving readjustments, transfers and reorganizations have been adopted which it is hoped and believed will place the various missions in a greatly improved position, and allow of the continuance of these missions which it is felt ought not to be surrendered. The secretaries will plan, so far as possible, to carry on the work which can hardly be abandoned without loss by some other agencies. The bishops have issued a statement to the Church and the public that there is, we believe, no weakening among the ministry or laymen in the conviction that we ought to hold on to the 18th Constitutional Amendment and to the laws resting upon it. All religious denominations are working together to insist that the laws against the free use of liquor as a beverage shall not be broken down. They urge the young people of the Church not to allow themselves to be misled by accepting the plea that the terrible scourge can be adopted without great damage to morals and civil wellbeing.

Union of Negro Methodist Bodies.—There has been pending for several years the question of the adoption of a plan of union between the African Methodist Episcopal, and the African Methodist Episcopal Zion Churches. The General Conferences voted on the subject a few years ago and agreed to it. The announcement was made at Washington, D. C., in March, 1930, that the Joint Commission representing the two denominations had met there and canvassed the returns from the annual Conferences and found that in the African Methodist Episcopal Church 77 conferences had voted and that 60 had voted unanimously for union, and nine conferences were yet to vote from the African Methodist Episcopal Zion Church. Reports showed that 31 conferences had voted unanimously for union and seven conferences were yet to vote. It remains to submit the question to the lay members of the two churches. The Commission agreed that this should begin not later than Sept. 1, 1930, and continued for a period of four months. The Commission met Jan. 1, 1931, to count the votes. The Commission appointed a sub-committee to prepare all necessary details respecting property rights and arrangements for actual union. The two bodies will represent a constituency of considerably over 1,000,000 members with over 10,000 ministers and property estimated at several million dollars.

The Question of Negro Equality.—A meeting of three hundred Methodist women, under the auspices of the International Committee of New York Church Federation, was held in the Fall of 1930, at which Mrs. Ida L. Wallace, wife of Bishop Wallace of the African Methodist Episcopal Church, was the chief speaker. She said, "the strength of our cause lies in adding to the emphasis on Christ in the religious life," instead of on Jonah and the whale. Jehovah was paternal, but Christ was fraternal. Slavery and racial inferiority was a logical result of the old beliefs; today Negro prestige is gaining in direct ratio to the breaking down of fundamentalism. The progress of a common culture in both races is uprooting the prejudices of 300 years. The leaders of her own race—Paul Robeson, Roland Hayes, Robert Russa Morton—"cannot fail," she said, "to unite our sympathies more closely. Give the Negro every opportunity to achieve economic independence. Social equality will never be his until he is freed from performing only menial tasks."

Union of Methodists in Great Britain.—Three of the remaining Wesleyan bodies in Great Britain have agreed to form a union. The first day is "A Day with God" and no business is to be transacted. The second day will be devoted to "historic services" in Westminster Abbey or St. Paul's. Next there are to be three types of union services, the last to be for the young people. Among other notable things are a call for "a sober and slumless England," "a million new young worshippers," and other things to make the celebration memorable.

Ecumenical Methodist Conference in Atlanta.—The Sixth Ecumenical Conference, including all organized Methodism in the World, will be held October 16-25, 1931, in Atlanta, Ga. The fifth conference was held in London in September, 1921, the meeting, alternating every tenth year between America and Great Britain. The Committee consists of two sections, an Eastern and a Western. The Western consists of forty members, with Bishop William F. McDowell, as chairman; Bishop E. M. Manzon, Methodist Episcopal Church, South, Vice-President; Dr. T. D. Ellis, of Louisville, Ky., Secretary, and Dr. James R. Joy, of New York, Treasurer. The Eastern Section, including Great Britain, Australia and other countries, has the same number of committee members, Rev. Dr. H. B. Workman, chairman. The Conference will consist of 550 delegates of which the Western Section will have 330 and the Eastern 220. The Program Committee has fixed upon "Methodism in the Life of Today" as the general name for the program. The Conference is to be divided into four groups for the afternoon sessions. These groups, composed of representatives from every race and section of world Methodism, will consider the church's relation to modern human relations and will report the findings of the Ecumenical Conference as a whole for definite pronouncement. The subjects will run the gamut from the basis of Christian faith to Methodism's responsibilities and attitude toward the press and moving pictures as international factors as well as responsibility to the non-Christian world. The Conference will plan a visit to the historic places in and about Savannah, Georgia, where John Wesley labored as a missionary from 1735 to 1737.

Union of Korean Methodists.—The question of union of the two large Methodist Episcopal Churches, North and South, drags, if it moves at all, but the two conferences in Mexico have come together with fair promptness, and now the conferences of the two churches in Korea will become one some time this year, in this, copying the two conferences in Japan. It is proposed, however, that the Korean Church shall maintain a relation for their own sake with the home churches from which they sprang. Korea is under the political care of Japan. If each half can keep in connection with the Church from which it springs in America, it is felt that the two halves of the whole in Korea will have sense of a protection which it may not feel now. The two conferences which united in Japan have no relation with the churches which planted them except in a distant fraternity.

THE PRESBYTERIAN COMMUNION

Proposed Unions.—The Alliance of the Reformed Churches Throughout the World Holding the Presbyterian System was organized in London in 1875. It meets every four years. It consists of 106 denominational bodies, eleven being in the United States with 3,236,551 members and 6,000,000 adherents. Proposed unions of Presbyterian bodies among themselves and also with other denominations have been a feature of 1929-30. On Jan. 28-29, 1930, there was held a meeting of commissions of Presbyterian and Reformed bodies on the question of union, called by the commission committee of the United Presbyterian Church and attended by that body, the Southern Presbyterian, the Presbyterian Church in the U. S. A., the Reformed Church in America (formerly Dutch), and the Reformed Church in the U. S. (formerly German). The latter did not participate in the Pittsburgh meeting, however, because it had entered into a plan of union which is still pending with the United Brethren in Christ and the Symbol of the Evangelical Church of North America. After some discussion, this meeting agreed that the churches conferring approve of the union of these bodies and also with other Presbyterian and Reformed bodies on the basis of their existing standards. In 1929 there were proposals of union between the Methodist Episcopal, the Presbyterian Church in the U.S.A. and other bodies, and also a call to consider union between the Protestant Episcopal, the Presbyterian Churches, North and South, the Methodist Episcopal, North and South. A meeting of the committees was duly held last year. The committees representing the Reformed Church in the U.S., the Evangelical Symbol of North America and the United Brethren in Christ agreed in 1930 upon a plan of union. The last named church asked permission of the other two bodies to submit the plan to its annual conferences for approval. The result has not yet been reported. The moderator of the Presbyterian General Assembly, Dr. Cleland B. McAfee, expresses the opinion that several Presbyterian bodies will be united in a year or two.

Scottish United Church—First Regular Assembly.—It will be remembered that in 1929 the two great Presbyterian Churches in Scotland, the Church of Scotland, for many years the State Church, called variously the Old Kirk or Church of Scotland, and the United Free Church, a union of the former Free Church of Scotland and the United Church, were happily united in one, the older church becoming separated from the State Church. In the summer of 1930 the first regular General Assembly of the United Church was held. Adjustments had to be made as the form of proceedings of the "Auld Kirk" were quite different from those of the United Free Church. The "Kirk's" connection with the State having been separated, much of the formality was unnecessary. The meeting was held in the building where the Church of Scotland formerly met, and the members who had been accustomed to the quiet procedure of the United Church felt, it is said, a little out of place, and had to accustom themselves to the sight of a throne gallery occupied by scarlet-coated representatives, the gilded mace and uniformed purse bearers, symbols of royal authority now withdrawn. The retiring moderator called attention to the fact that these signs of the presence of royalty had been set up outside of the deliberative portion of the hall. The lord high commissioner is not now an honored guest, but is simply allowed to be present as a visitor. On the opening day pursuivants, heralds, the legion King of Arms and members of various town councils, robed in scarlet and ermine to show what used to be The General Assembly, is now much larger than it used to be consisting of 1,547 members, the present rule permitting each minister to be a member every fourth year. It was interesting to note that the former Church of Scotland had received for foreign missions a record-breaking sum from congregations and donors. The two committees announced that they had received between them £33,000 to meet the deficit reported by the smaller body.

John Buchan, M.P., Scotch novelist, has written the history of the "Auld Kirk," 1560-1929, and pays this tribute to the union which took place in 1929: "The church carries with it the destiny of coming generations of our countrymen and of that beloved and ancient and mystical thing, our own Scottish fatherland. Its hope is less in its new structure than in the spirit that inspires it, a keener and more vigilant purpose, a spirit of brotherhood and charity, since the old unhappy things have become far off and forgotten. Matthew Arnold in his poem *Sohrab and Rustum,* describes how the Oxus flows through the "'hushed Charasman waste,' and how the sands split its currents and dam its streams, until at last the dash of waves is heard, and the river finds enlargement and peace in the great sea. It has been so with our church. It began with the bright speed of a mountain stream, but soon found its course split and divided, and too often in the last three centuries it has been a foiled circuitous wanderer. Now once again its currents are united, brimming and bright and large, and united it flows into the deserts of the world which never had more need of its reviving power. And somewhere in the far distance it may find, like Oxus, a still greater union in that ocean to which the streams of every Christian Church will pour their waters, 'and tranquil, from whose shore, the new bathed wide stars emerge and shine upon the Astral Sea.'"

INTERDENOMINATIONAL ORGANIZATION

On the invitation of a Commission of the Protestant Episcopal Church a conference was held by three members of the above named body in New York in October, 1929, with the Presbyterian Church, North and South, and the Northern and Southern Methodist Church, and it was stated that the movement came from the Episcopal Church and that its purpose was to make an active study of Christian morality looking towards organic union. Each commission was requested to make a study on the questions submitted and prepare a report thereon. Among the subjects mentioned were these: The relation between church and state; the authority of the church on moral and social questions and how enforced; also the following particular questions on which each Church may have made deliverances: family marriage and divorce; international relations; racial relations; economic and industrial relations; sumptuary legislation; law observance proper observance of the Lord's day; moral and religious instruction of youth; how far our divisions are due to differences on moral and social problems.

A meeting was held in June last and each representative made such presentation in response to the questions asked as he desired. The outcome was the adoption of a report which stated that it was a matter of satisfaction to observe that the harmony of the efforts made was much greater than was anticipated; that there are no theological or ecclesiastical facts now operative in such degree as to block the way to organic union; that the three communions are as one in recognizing the authority of the church to back and guide the individual in the development of his Christian life and to exercise necessary discipline; that in the matter of marriage and divorce they are in complete agreement; that they are in agreement concerning international peace and that all have acted consistently on the subject of dealing with racial relations.

SALVATION ARMY

Abolition of Right of Succession. —The Commissioners of the Salvation Army, meeting recently in London, adopted three proposals set forth by the present commander, Gen. Edward Higgins, which will prevent the reestablishment of the family dynasty in the future. Control of the Salvation Army in property in Great Britain will hereafter be vested in a Board of Trustees and not Gen. Higgins. Gen. Higgins proposes to retire at the age of 70 which will be in 1932. Future generals will hereafter be chosen by vote of the high council, which consists of all the commissioners, rather than by choice of the former general. Only Catherine Booth, daughter of the late Gen. Bramwell Booth, opposed this change.

Relief Fund.—The American Salvation Army is raising $500,000 for relief of the needy. The Salvation Army organized early in December in New York City an Emergency Employment Committee to raise this large sum of money for the relief of those who are suffering for the lack of income for support. A luncheon with more than 900 present was given at the Biltmore for this purpose. Distinguished men and women were present to encourage the movement. They said they did not consider the Salvation Army as a competitor, but desired to help them to succeed and would add $100,000, making a total of $600,000. The Army appointed 60 captains of campaign teams, and announced teas for five evenings for reports from the teams.

MISSIONS IN CHINA

Chinese President a Christian Convert.—In October, 1930, Chiang Kai-Shek, President of the Chinese Nationalist Government and generalissimo of its armies, was baptized as a Christian at his own request, according to the rites of the Methodist Episcopal Church South, by Rev. Z. T. Kaung, pastor of the Church in Shanghai. The ceremony took place at the home of Mme. K. J. Soong, mother of Chiang's wife, who is a graduate of Wellesley College. Chiang becomes a member of the young Allen Church, Dr. Allen having been the founder of the mission. The President is said to be the first Chinese high ruler to become a Christian. Prominent Chinese Christians in the Shanghai Nationalist regime are T. V. Soong, Finance Minister, graduate of Harvard University and brother-in-law of President Chiang; H. H. King, Minister of Commerce, and C. T. Wang, Minister of Foreign Affairs. The President's conversion is in part the result of the influence of his wife.

Nanking Government Closes Mission Schools.—The Minister of Education objects to teaching Christianity in the Mission schools, mentioning four reasons for the prohibition: (1) because they teach only the Christian religion, whereas other religions should be taught at the same time; (2) that unless children are protected from the approaches of religion in their youth they will not be free to make national religious choices at maturity; (3) that if, as they say, their churches are not conducting their schools as a means of gaining members they will not be deeply affected by the elimination of religion from the curriculum; (4) that religion is an unfit subject for inclusion in a modern scientific education, because "it is only one type of abstract intangible imagination." The national Christian Council representing 15 different Christian bodies and a membership of 250,000 persons made reply to the statement of the Minister of Education, showing how Soviet reasoning and scientific agnosticism are mingled in the argument of the Minister who is taking the course which Japan and other non-Christian countries tried until they became satisfied by experiment that religion helps to make good, broad-minded students and citizens.

PROPOSED UNION IN SOUTH INDIA

By H. K. Carroll

General Statistician of the Churches

Agreement.—For some years the matter of union in South India, including the Anglican Communion, the Wesleyan Methodist Church and the South India United Church, (the last named embracing the American Congregational and Presbyterian missions) has been under consideration. Articles relating to the meetings held by these various bodies, from time to time have been published, indicating the difficulties encountered and the proposals approved. It was evident at the beginning that the congregational polity presented a question which needed to be harmonized, and this was done when the Presbyterian and Congregational missionaries reached an agreement on this point which enabled these two bodies to form a union, known as the South India Church. But how could the Church of India, Burma and Ceylon, composed of the Anglican organization, with its Episcopal system, find a basis of union with the South India United Church, embracing the Congregational and Presbyterian bodies and the South India Provincial Synod of the Wesleyan Methodist Church,

Difficulties of Union.—The first entry of the American Missionary work in South India was the American Board in Madura and Ceylon and then the Presbyterians; then came the London Missionary Society (English Congregational) in Travancose and South India; the United Free Church of Scotland, in and around Madras; the Reformed Church in America, in Arcot; later still the Basel Missionary Society in Malabar. All these and other beginnings came into this section in India, and for years they have been endeavoring to form a Union which shall include all Evangelistic Christian workers. Efforts to bring about union among some of these bodies had failed more than once for various reasons. But in 1921, after the Lambeth Conference of 1920, the matter was taken up again in the General Assembly of the South India Church and the Bishops representing the Anglican Church and a plan was agreed upon and submitted to the nine councils, seven of which agreed to accept episcopacy as a basis of union.

The Plan Before The Lambeth Conference.—Out of this series of meetings grew "The Proposed Scheme of Union," and it is this document that the Indian Bishops carried with them to the late Lambeth Conference, and which the Conference had before it when it took action on the subject. The Conference expressed its pleasure that the plan submitted does not propose to form any fresh Church or Province of the Anglican Communion, but to bring together the distinctive elements of the different Christian Communions in a district province of a Universal Church, and suggests that a complete agreement on union should not await the inauguration of the plan, but that it should proceed at once, trusting that it will lead to the emergence of a part of the body of Christ in a new combination of riches that are Christ's. A request has come from the Bishop of Calcutta to the Protestant Episcopal Church that it begin the inauguration of missionary work in India, since it is not represented there, and has left most of all, to be done by other American bodies. If actual union, including Anglican Church in India, takes place, there will be a union in which Anglicans, Congregationalists, Presbyterians, Methodists of the Wesleyan branch and various other bodies of the Protestant divisions will be members of the first organization of the kind which the world has seen, and what is accomplished in India, if successfully accomplished, will undoubtedly be attempted in other great missionary fields. With such unions in foreign countries, working satisfactorily, why should not the various Churches give up their divisions and go on to a world-wide organization of the Disciples of Christ? Some such dream as this may yet be entertained.

THE ROMAN CATHOLIC CHURCH

By John B. Kelly

Spiritual Director, Catholic Writers' Guild

MEMBERSHIP, CHURCHES AND SCHOOLS

The Roman Catholic Church in the United States, according to the latest statistics available, had in 1930 a membership of 20,203,702. Its churches number 18,166, and its priesthood has on its rolls 26,925 men in full major orders. Of these 18,873 are diocesan clergymen, and 9,052 are members of Religious Orders. There are 102 Bishops, 12 Archbishops, and 4 Cardinals in the American Catholic hierarchy. In the elementary schools there are about 2,000,000 pupils, the schools numbering 7,666, an increase of about 90,000 pupils who required the establishment of 215 structures dedicated to their accommodation.

CHURCH AGENCIES

Hospitals.—In the sphere of ministering to physical need there are about 96,000 dispensaries which have cared for about 2,600,000 patients in the past year in daily ministrations. Catholic hospitals provide seventy-four per cent of all the beds needed for those seeking relief in the sick-caring institutions of the land.

Knights of Columbus.—In the sphere of the social and general lay action the Knights of Columbus, acting in 2,595 Councils, have enrolled a national membership of about 625,000 members.

National Council of Catholic Men.—One thousand four hundred and sixty-four Catholic bodies of laity have been affiliated under the general head of another organization bearing the title The National Council of Catholic Men.

CURRENT ACTIVITIES

Contribution to National Library.—Among the events of 1930 which attracted general interest was the donation by the Vatican authorities to the National Library in Washington of fifteen Papal Bulls regarded as valuable historical documents.

China.—A foreign event which evoked American protest was the attack by Chinese "Reds" upon the American missionaries of Maryknoll working among the Orientals, resulting in acute suffering, on the part of the victims.

Eucharistic Congresses.—The annual Eucharistic Congress was held this year in the City of Carthage, North Africa, from February to May, during which period the devotions of Perpetual Adoration were maintained. The American Eucharistic Congress was convened in the City of Omaha, Neb., for three days, Sept. 23-24-25. The Papal Delegate attended the Congress with 56 of the country's Bishops, and a gratifying feature of the meeting was the receipt of an official message from President Herbert Hoover commending the participants as citizens contributing much to the spiritual assets of this commonwealth.

Gold Star Mother Pilgrimage.—Earlier in the year there was a large pilgrimage of Gold Star mothers to the enshrined graves of their sons in France where they reconsecrated to God their offering of the heroic dead. Seven hundred and forty representatives of American motherhood made the journey overseas.

Catholic Radio Hour.—The year also records the inauguration and establishment of a Catholic Radio Hour under the auspices of the National Council of Catholic Men. The radio station WEAF of the National Broadcasting Company in New York City is the station whence emanates each Sunday a message of Catholic doctrine explained or precept to be understood and observed by Church members.

PAPAL ENCYCLICALS

Christian Education.—Among the Papal communications to America were the various Encyclicals of the year. Pope Pius XI issued one on the principles of Christian Education, and another in the form of an elucidation and commentary upon the Roman Question which seems to be satisfactorily solved.

Women's Dress.—In March the universal Church was addressed by the Sacred Roman Congregation on the subject, "Papal Instructions Regarding Woman's Dress," a plea for modesty and general propriety in feminine attire.

Russian Persecution.—A Pontifical letter on religious persecutions in Russia was released to the Church universal revealing the Soviet Government in a policy of imposing its atheistic doctrines upon all its people.

It was this Encyclical that did much to bring to utterance the convictions of many Jewish and Protestant bodies in America who joined in outspoken resentment against the Russian authorities guilty in their eyes, of maliciously profaning rights generally recognized as human and divine. The result of this combined protest of separated religious groups in this country has been the establishment of better understanding and more sympathetic relations.

Religious Retreats.—It should be mentioned that among events of ecclesiastical interest to Catholic Americans was the encyclical issued in January recommending the widespread establishment of, and participation in such spiritual exercises for the laity as Retreats and other forms of personal sanctification through contact with devotional and instructive exercises catering to the particular needs of groups young and old, married and single in both sexes.

MISCELLANEOUS

Personnel.—Word came here from the Eternal City announcing the death of Cardinal Merry del Val in February, and of the appointment of Cardinal Pietro Pacelli to the post of Secretary of State as the successor of the late Cardinal Gasparri.

The National Catholic Welfare Conference is the central body functioning as a source of general information on Church affairs through its ten Bureaus in Washington. The latter are captioned "Bulletin," "Investigation," "Historical Records," "Publication," "Publicity," "Motion Pictures," "Information," "Press," "Social Action," "Legal and Lay Organizations."

Mission reports indicate an inrease of 23 newly established bases, and moneys amounting to $1,381,000 were formally given to Foreign Missions by America.

The Theatre.—His Eminence Patrick Cardinal Hayes of the New York Archdiocese toward the end of the year made a nationally noted plea for higher moral standards in the American Theatre. His words evoked warm endorsements from many leaders of other religious bodies in the country, and inspired the nation's powers to urge our patrons to dramatic production to support only the decent works of stagecraft.

THE ORIENTAL ORTHODOX CHURCH

By H. K. Carroll

General Statistician of the Churches

RELATIONS WITH ANGLICAN COMMUNION

Representatives of this ancient body, next in age to the Roman Catholic Church, have been drawing closer to the Anglican Communion for some years and the two bodies are becoming still more friendly, as was shown by the presence of the Patriarch of Alexandria and other prelates at the meeting in July last of the Lambeth Conference in London. They were also in attendance at the World Conference of Faith and Order, held in 1927 in Lausanne, Switzerland. In this conference they were brought into friendly relations also with representatives of the great body of Protestants. Other dignitaries of the Eastern Church, often called also the Greek Church, sat with the Archbishops of Canterbury and York in the recent Conference. It is understood that a meeting is to take place this year or next of the prelates of Athos and Constantinople and other dignitaries to bring about agreement between them, which, if successful, may lead to an assemblage like that which adjourned in August at Lambeth and pave the way for still closer relations between the Anglican and the Eastern Churches. This would be a Union of two great bodies constituting the greatest yet known advance toward the healing of the differences between the two largest Christian bodies ever accomplished. In the United States the Orthodox Church which has been divided for years in at least two bodies was last year brought together at least temporarily and it is hoped the union will not be broken down.

RUSSIAN THEOLOGICAL ACADEMY IN PARIS

The condition of the Russian Church is spoken of as "appalling," by those who have been visiting Russia itself. Persecution is severe and the churches find it difficult to exist, much less to accomplish anything for the help of those who would endeavor to maintain church worship. But something is being done according to a writer in France. In the French Capital a center of Christian life has been established under great difficulty for the Russians are poor and find it hard to maintain themselves. The work that is being done is to maintain worship near the Buttes Chaumont Park and much is being done for the intellectual, the spiritual and social needs, especially of the young people, with the help of the Y. M. C. A. The training for the priesthood includes some fifty young students, most of whom, the teachers as well as the young converts, are, of course, exiles. Some of the converts are adults, having had their first opportunity since coming into relation with the Orthodox Church in the French Capital. The training, though extremely difficult, is effective for it is adapted to the problems of the new age, and the teachers have modern learning which is needed to propagate the old faith under very hard conditions. One preacher in an industrial community works six days a week, with his group, so hard and so necessary is the work of maintenance in the presence of many who are hostile to Christianity. There are ten professors engaged in the work of training, who get an average pay of only $720 a year, the students being fed by contract at about thirty cents a day each. Many would deem the physical conditions intolerable, twenty-five men sleeping together in one room. The textbooks are so scarce that often one must do for 15 men. Still they persevere. A stimulating intellectual life, utterly consecrated leadership and whole and homely piety, keep them going. Committees have been formed in Boston, New York and Philadelphia to raise $16,200 as quickly as possible to help these needy young Christians.

JUDAISM AND JEWISH COMMUNAL AFFAIRS

By Bernard G. Richards

Executive Secretary, American Jewish Congress

EDUCATION

Jewish Educational Association.—The Jewish Educational Association of New York, Israel Unterburg, President, which, under the active leadership of Bernard Semel, Honorary Secretary, encourages the establishment of, and endows various schools, has campaigned and secured larger funds for its activities these being paralleled by different bodies in a number of large cities west and south. In a number of these large cities, like Chicago, Boston, Cleveland, Detroit, St. Louis, San Francisco, etc., there exist colleges or schools for the training of religious teachers for the requirements of the various schools in different communities, those which are attached to synagogues and temples as well as those which are conducted independently by associations of Jewish men and women especially interested in the subject.

Bureau of Jewish Education.—Identified with this activity is the Bureau of Jewish Education, New York, Dr. Samson Benderly, Director, which devotes itself chiefly to the elaboration of curricula and school methods as applied to Jewish education, and the work of this Bureau is duplicated by other cities having similar bureaus or agencies for experimentation, which, for the most part, are associated with colleges devoting theselves to the training of teachers, etc.

Other Bodies.—Supplementing the educational and cultural activities of other bodies are: Young Judea, an organization of the Jewish youth, sponsored by the Zionists, Rabbi Israel Goldstein, President; Avukah, American Student Zionist Federation, Rabbi Samuel M. Blumenfeld, President; Menorah Intercollegiate Association, Henry Hurwitz, Chancellor; the Hillel Foundation for work among students, fostered by the Independent Order B'Nai B'rith, Alfred M. Cohen, President.

THEOLOGICAL SEMINARIES

As has been indicated before, the latest addition to the Jewish theological seminaries is the Yeshiva College, of which the Rev. Dr. Bernard Revel is President, this institution being an outgrowth of the ultra-orthodox Yeshiva or Isaac Elchanan Seminary of the lower east side of New York, which, with the opening of the new building at Amsterdam Avenue and 186th Street, the year before last, entered upon its career as a combined religious seminary and secular college offering for the first time an example of a college modeled along parochial lines. Owing to the difficulties inherent in this experiment, as well as to a shortage of funds, this institution is still passing through its period of trial.

The three other large Jewish colleges for the training of rabbis and teachers of religion have recorded a year of progress, all of them having extended their interests in their respective fields and each one adding important volumes to remarkable collections of Jewish books in their libraries.

The Jewish Theological Seminary, New York, Dr. Cyrus Adler, President, has, during the year, formally dedicated its group of three new buildings at Broadway, 122nd and 123rd Streets. One of the buildings is for the use of the students as a Dormitory, one for the several departments of the Teachers Institute for the training of Jewish religious teachers, and the other for the Library and Museum of the Seminary. The other institutions include the Hebrew Union College, Cincinnati, Dr. Julian Morgenstern, President; the Jewish Institute of Religion, New York, Dr. Stephen S. Wise, President.

SYNAGOGUES AND COMMUNITY CENTERS

Religious Organizations.—The tendency to combine synagogue activities with social and educational aims has during the past year given further impetus to the building of temples and synagogues in different cities having special facilities for such social and educational functions and gatherings and in many cases elaborate edifices have come into being with adjoining communal or social halls, libraries, lecture rooms, etc. In the work of the synagogue and the extension of its influence in the direction of religious training and general Jewish education, bodies like the Union of American Hebrew Congregations, Charles Shohl, Honorary President, representing the reformed wing of Judaism; United Synagogue of America, Nathan Levy, President, speaking for the conservative or the middle-of-the-road elements; and the Union of Orthodox Jewish Congregations of America, Herbert S. Goldstein, President, aiming to conserve the old and traditional attitude, have played an important role during the past year. Among the other forces in the religious life of the Jews of America are the National Federation of Temple Sisterhoods, Mrs. Maurice Steinfeld, President; the National Federation of Temple Brotherhoods, Roger W. Straus, President; and the National Council of Jewish Women, Mrs. Joseph E. Friend, President.

Social Centers.—Progress has been made in a number of different cities during the year by the popular movement for the creation of Jewish community centers or Hebrew Young Men or Women's Associations, serving in most instances as combined houses of worship, religious schools and places of recreation. The Jewish Welfare Board, Justice Irving Lehman, President, a joint outgrowth of early centralized activities of the Young Men's Hebrew Associations with later ministrations to Jewish members of the U. S. Army and Navy, especially in the World War, now directs its chief efforts towards the encouragement of the establishment of these and other Jewish social centers, and the development of educational and literary programs for them.

JEWISH NATIONAL HOMELAND

Shaw and Simpson Reports.—Following the Sixteenth Biennial International Congress of the World Zionist Organization, held in Zurich, Switzerland, in August, 1929, and its acceptance of the plan for the extended Jewish Agency, which, making possible the coöperation between Zionist and non-Zionist in the work for the establishment of the Jewish National Home, was to usher in a new era in the progress of this task, a number of untoward events have taken place, giving anxiety and deep concern to Jews in all parts of the world. The frightful massacres of Jews perpetrated by Arabs soon after the session of this Congress was the beginning of a number of changes spelling discouragement to the Zionist cause. The report of the Inter-Parliamentary Investigating Commission, known as the Shaw Report, tended to belittle the outrages, and, according to eminent authorities, to give a one-sided picture of the events which have led up to the attacks, with only the reservations of Harry Snell, the Labor Member of Parliament, frankly facing all circumstances and putting the largest part of the blame upon the inefficiency shown and the prejudice displayed by the British Administration in Palestine. The temporary suspension of Jewish immigration into Palestine and the unfavorable report of Sir John Hope Simpson, sent by the Colonial Office to survey conditions relating to immigration and land purchase, were the causes of further protests on part of the Zionists in particular and the Jewish communities in general. To be sure the report of the Mandates Commission of the League of Nations, issued last June, severely criticizing the Shaw Report, and maintaining that England was not living up to the terms of the Mandate, gave much comfort to all those whose labors and aspirations center around the Zionist ideal.

Lord Passfield's White Paper.—But there came a climax to the unfortunate developments when Lord Passfield as Colonial Secretary issued Oct. 20, the celebrated White Paper, based upon the Simpson Report, which directly restricts and circumscribes the rights which had previously been granted to the Jews in the famous Balfour Declaration and in the Mandate over Palestine, this document going so far in its criticism and retracing of steps as to amount to an affront to the Jewish people. Threatening to nullify the solemn obligation of England and Associated Powers, as approved by leading nations of the world, and to undermine the labor of several generations of pioneers in Palestine, the publication of this document roused unparalleled demonstrations of indignation from Jewish communities in all parts of the world, hugely attended mass meetings everywhere, charging the British Government with having betrayed the Jewish people. These gatherings with their ringing addresses and resolutions soon had their repercussions in official circles in many parts of the world and notable British as well as other statesmen voiced their criticism of the English policy and their sympathy with Zionist aspirations. Not the least emphatic part of the world-wide protest was the attitude of Zionist and Jewish leaders who tendered their resignations to the Zionist Organization and to the Jewish Agency as a protest against the Passfield White Paper.

Future British Policy.—As on previous occasions, Premier MacDonald and other representatives of the British Government gave assurances that the Passfield Paper was not intended to abrogate either the Balfour

Declaration or the terms of the Mandate, saying that the future policies to be pursued are chiefly a matter of formulation. Since then conversations or negotiations are known to have gone on for many weeks between members of the British Cabinet and representatives of the Zionist Organization and the Jewish Agency for Palestine, and the Jewish world having been somewhat put at ease and encouraged by reports indicating a certain progress in these conferences.

EUROPEAN RELIEF

The Joint Distribution Committee, Felix M. Warburg, Chairman, has continued to carry on its various activities for the relief of members of Jewish communities in Poland, Russia, Roumania, and other Eastern European countries where economic depression has now added to the burdens left behind by the ravages of the World War.

Russia.—In addition, Soviet Russia, with approximately a million declassed Jews, and with all kinds of complications created by the Bolshevist crusade against religion, Jewish culture, etc., has given further cause for anxiety to American Jewish organizations and to Jews here generally who are interested in the plight of their brethren abroad. With the Jewish agricultural enterprises not having fulfilled their promise, with industrialization in the cities representing a huge and difficult task, much further thought and material aid are required to grapple with the problem and to attain at least some measure of success. Associated with the Joint Distribution Committee in work of relief in Russia is the American Committee of the Ort of which Murray Levine is Chairman. The Ort specializes in providing machinery and tools for Jewish laborers and in encouraging manual training and activities within the Jewish population. The ruthless Bolshevik campaign against all forms of religion in general, and against Judaism, Jewish culture and Zionism in particular, was, during the year, the occasion of a significant protest movement initiated by the American Jewish Congress, Bernard S. Deutsch, President, which, at first elicited the interest of wide Jewish circles, afterwards extended to the general public. Christian groups, feeling identical concern, later joined in general manifestations of indignation and horror at the Soviet persecutions and blasphemies. The protest which extended to different parts of the world is known to have had a perceptible effect upon the Soviet authorities who subsequently counselled moderation in the atheistic propaganda.

PROTECTION OF MINORITIES

Denial or curtailment of the rights of Jewish citizenship and other forms of injustice and intolerance practised from time to time in various Eastern European countries more especially in Roumania, Poland, and Hungary, have continued to form the basis of activities; namely, representations to the governments in behalf of fair treatment, appeals to public opinion, etc., conducted by the American Jewish Congress, which body has recently also dealt with the problem of discrimination against Jews in the field of employment in the United States. Similar activities having to do chiefly with the protection of Jewish minorities abroad have been pursued by the American Jewish Committee, Dr. Cyrus Adler, President, these steps being seconded by notable Jewish organizations in Europe.

COGNATE SOCIETIES

NATIONAL CHURCHES

AMERICAN CONGREGATIONAL ASSN., 14 Beacon St., Boston, Mass.

AMERICAN THEOSOPHICAL SOCIETY, Wheaton, Ill.

AMERICAN UNITARIAN ASSN., 25 Beacon St., Boston, Mass.

ANGLICAN UNIVERSAL CHURCH OF CHRIST IN THE U. S. A., 22 E. 38th St., New York City.

BOARD OF DIRECTORS OF THE GENERAL SYNOD OF THE REFORMED CHURCH IN AMERICA, 25 E. 22nd St., New York City.

Centenary Conservation Committee of the Methodist Episcopal Church, 111 5th Ave., New York City.

Christian Science Church, 11 W. 42nd St., New York City.

Congregational Conference, Inc., 287 Fourth Ave., New York City.

Freethinkers' Society of New York, 226 W. 58th St., New York City.

Friends General Conference, 1515 Cherry St., Philadelphia, Pa.

General Conference of Seventh-Day Adventists, 140 Eastern Ave., N. W., Takoma Park, Washington, D. C.

General Council of the Presbyterian Church in the U. S. A., 156 Fifth Avenue, New York City.

National Lutheran Council in America, 437 Fifth Ave., New York City.

Nationalist Spiritualist Assn., 600 Penn Ave., S. E., Washington, D. C.

Northern Baptist Convention, 5109 Waterman Ave., St. Louis, Mo.

Society for Ethical Culture of New York, 2 W. 64th St., New York City.

Union of American Hebrew Congregations, Merchants' Building, Cincinnati, Ohio.

Union of Orthodox Jewish Congregations of America, 50 W. 77th St., New York City.

United Lutheran Church in America, 39 E. 35th St., New York City.

United Synagogue of America, 531 W. 123rd St., New York City.

Universalist General Convention, 176 Newburg St., Boston, Mass.

Vedanta Society, 34 W. 71st St., New York City.

Volunteers of America, 34 W. 28th St., New York City.

INTERNATIONAL ORGANIZATIONS

Alliance of Reformed Churches Throughout the World Holding the Presbyterian System, 510 Witherspoon Bldg., Philadelphia, Pa.

Assn. for the Promotion of Christian Unity, Chamber of Commerce Bldg., Room 412, Indianapolis, Ind.

Baptist World Alliance, Bates College, Lewiston, Me.

Central Bureau of Evangelical Churches in Europe, 105 E. 22nd St., New York City.

Committee on Cooperation in Latin America, 419 Fourth Ave., New York City.

Continuation Committee of World Conference on Faith and Order, P. O. Box 226, Boston, Mass.

Ecumenical Methodist Conference, 145 Westervelt Ave., Plainfield, N. J.

International Assn. of Daily Vacation Bible Schools, 100 E. 42nd St., New York City.

International Congregational Council, 14 Beacon St., Boston, Mass.

International Congress of Religious Liberals, 25 Beacon St., Boston, Mass.

International Council of Religious Education, 1516 Mallers Bldg., 5 S. Wabash Ave., Chicago, Ill.

International Evangelistic Bureau of the U. S. A., 1111 Walnut St., Cairo, Ill.

International Society of Christian Endeavor, 41 Mt. Vernon St., Boston, Mass.

Lambeth Conference, Anglical Communion, Bishop of Winchester, England.

Lutheran World Convention, 437 Fifth Ave., New York City.

Protestant Unity League, 71 W. 23rd St., New York City.

Universal Christian Conference on Life and Work, 70 Fifth Ave., New York City.

World's Student Christian Federation, 70 Fifh Ave., New York City.

World's Sunday School Assn., 1 Madison Ave., New York City.

INTERCHURCH ORGANIZATIONS

American Secular Union, P. O. Box 1109, Chicago, Ill.

American Sunday School Union, 1816 Chestnut St., Philadelphia, Pa.

Chaplains' Aid Assn., 401 W. 59th St., New York City.

Christian Unity Foundation, 70 Fifth Ave., New York City.

Church Peace Union, 70 Fifth Ave., New York City.

Commission of Reference and Council Committees, 25 Madison Ave., New York City.

Conference of Theological Seminaries and Colleges, Lancaster, Pa.

Council of Church Boards of Education, 111 Fifth Ave., New York City.

Federal Council of Churches, 71 W. 23rd St., New York City.

Federal Council of Churches of Christ in America, 105 E. 22nd St., New York City.

Federation of Churches, 71 W. 23rd St., New York City.

Fellowship of Reconciliation, Bible House, New York City.

Interdenominational Evangelistic Assn., Winona Lake, Ind.

National Council of Protestant Episcopal Churches, 281 Fourth Ave., New York City.

National Federation of Religious Liberals, 700 Oakwood Boulevard, Chicago, Ill.

AUXILIARY ORGANIZATIONS

Catholic Church Extension Society of the U. S. A., 180 N. Wabash Ave., Chicago, Ill.

Catholic Guardian Society, 130 W. 37th St., New York City.

Catholic Protective Society, 477 Madison Ave., New York City.

Epworth League of the Methodist Episcopal Church, 740 Rush St., Chicago, Ill.

Kings Daughters and Sons, 280 Madison Ave., New York City.

Lord's Day Alliance, 156 Fifth Ave., New York City.

Prison Evangel Assn., 156 Fifth Ave., New York City.

Sunday School Commission, Inc., 416 Lafayette St., New York City.

Woman's Christian Temperance Union, Evanston, Ill.

Woman's National Sabbath Alliance, 156 Fifth Ave., New York City.

Young Men's Christian Assn., 347 Madison Ave., New York City.

Young Women's Christian Assn., 600 Lexington Ave., New York City.

RELIGIOUS PUBLICATIONS

American Baptist Publication Society, 1701 Chestnut St., Philadelphia, Pa.

American Bible Society, Bible House, New York City.

American Tract Society, 7 W. 45th St., New York City.

Chicago Tract Society, 440 S. Dearborn St., Chicago, Ill.

Gideons, 140 E. Dearborn St., Chicago, Ill.

Institute of Social and Religious Research, 230 Park Ave., New York City.

National Testament .and Tract League, 200 Kellogg Bldg., Washington, D. C.

Pocket Testament League, 156 Fifth Ave., New York City.

Religious Education Assn., 308 N. Michigan Ave., Chicago, Ill.

Religious Publicity, 701 W. 177th St., New York City.

Society for the Propagation of the Faith, 462 Madison Ave., New York City.

Society of Biblical Literature and Exegesis, Broadway at 120th St., New York City.

MISSIONARY

American Board of Commissioners for Foreign Missions, 14 Beacon St., Boston, Mass.

American McAll Assn., 1713 Sansom St., Philadelphia, Pa.

Christian and Missionary Alliance, 260 W. 44th St., New York City.

Continuation Committee of the World Missionary Conference, 25 Madison Ave., New York City.

Council of Women for Home Missions, 105 E. 22nd St., New York City.

National Council of Jewish Women, 1776 Broadway, New York City.

Federation of Women's Boards of Foreign Missions, 419 Fourth Ave., New York City.

Foreign Missions Conference of N. A., 419 Fourth Ave., New York City.

International Missionary Conference, 347 Madison Ave., New York City.

International Missionary Union, 71 W. 23rd St., New York City.

Near East Relief, 149 Fifth Ave., New York City.

Student Volunteer Movement for Foreign Missions, 419 Fourth Ave., New York City.

Woman's Union Missionary Society, 67 Bible House, New York City.

PART SIX

SCIENCE—PRINCIPLES AND APPLICATION

DIVISION XVIII

MATHEMATICS AND ASTRONOMY

MATHEMATICS

By Tomlinson Fort
Professor, Lehigh University

RESEARCH AND ANALYSIS

Review.—Abstracts of 432 papers were published by the American Mathematical Society during 1930. All of these papers were accepted by the Program Committee as embodying original research. An analysis in detail of this vast amount of work, only a part of which has as yet been published, is out of the question. However, the reviewer can call attention to certain results that seem to him especially significant. This is done with apologies to the authors of the fine papers which it is impossible to mention.

Uniform Convergence.—Few concepts have proved more important than that of uniform convergence. Since it was first defined by Stokes and Weierstrass in the last century it has been of the greatest use to working mathematicians. A paper by D. C. Gillespie and W. A. Hurwitz, published in July, proves a most fundamental theorem; namely, that if a sequence of continuous functions converges to a continuous function it can be transformed by a regular transformation into a sequence which approaches the limit function uniformly. This theorem seems to the reviewer of particular interest. Hurwitz published another somewhat related paper on the oscillation of a sequence. A paper by R. P. Agnew on the summation of sequences of functions is along the same line and is of moment. Much of its inspiration apparently came from Hurwitz. Other contributions on closely related topics have been made by J. J. Gergen, C. N. Moore, Einar Hille and J. D. Tamarkin.

Integral Equations.—The central problem in the study of integral equations is the solving of equations for an unknown function which occurs under the definite integral sign. The work of J. D. Tamarkin has been especially valuable in developing the general theory of this field. He published several papers during the year. Among them was one paper on integro-differential equations in which the unknown function not only occurs under the integral sign, but through its derivative. A number of Tamarkin's papers have been written jointly with Einar Hille of Princeton.

Separation Theorems. — Writers on that branch of mathematics known as analysis situs have found a particularly interesting and useful field in the study of what is known as separation theorems. These theorems have in considerable part had to do with the Jordan-Brouwer theorem which, in its most elementary case, states that every simple plane closed curve divides the plane in which it lies into two parts. The novice is always surprised that a theorem, the truth of which he so readily admits, should be difficult to prove with mathematical rigor and that its extensions should lead to far-reaching mathematical studies. His surprise is soon dissipated, however, when he is shown the complex point configurations which mathematicians admit under the name, "curve," and, if he then contemplates generalizations, particularly to n-dimensions, he is apt to wonder how mathematicians have been able to handle the problem as effectively as they have. Of recent years, the worked of J. W. Alexander of Princeton on the Jordan-Brouwer theorem has been especially noteworthy. In the October number of *The Transactions of the American Mathematical Society,* a paper of moment by R. L. Wilder of Michigan appeared on the converse of the Jordan-Brouwer theorem. An especially noteworthy paper in the field of separation theorems is, "A Continuum, every Sub-continuum of which Separates the Plane" by G. T. Whyburn appearing in the April issue of the *American Journal of Mathematics.* The author sets up an example as suggested in the title and thus settles a matter that had been interesting mathematicians for some years. The work of W. A. Wilson of Yale and H. M. Gehman of Buffalo should also be mentioned in this connection.

Harmonic Analysis.—Anyone with more than the most elementary acquaintance with mathematics or mathematical physics knows the great importance of this subject. In 1925 Harold Bohr of Copenhagen, introduced into analysis a generalization of periodic functions which he called almost periodic functions. The work was taken up in America by several men at the Massachusetts Institute of Technology. Of these Norbert Wiener is especially to be mentioned. His work has been attracting the attention of mathematicians for several years. In *Acta Mathematica,* one of the most important European mathematical journals, Wiener published in 1930 a one hundred and thirty-page paper on "Generalized Harmonic Analysis." This paper sets forth some of Wiener's previous work and carries forward the problem of the representation of functions by harmonic series, particularly series of almost periodic functions. Wiener is especially interested in applying his work to problems in mathematical physics. In the paper in question, he applies his generalized analysis to studies of light.

Calculus of Variations.—The importance of the calculus of variations in research in America has already been pointed out in these pages in previous years. It is interesting to note that Marston Morse has continued his fine work on calculus of variations in the large. A significant paper by G. A. Bliss, appeared in the October issue of the *American Journal of Mathematics.* This paper is partly of an expository nature and can be more easily read than is usual with papers in the calculus of variations.

Differential Equations.—The subject of differential equations is, of course, a very broad one and many papers appear each year bearing upon it. A paper by J. F. Ritt, "Manifolds of Functions Defined by Systems of Algebraic Differential Equations," is important as it is concerned with the development of a theory of systems of algebraic ordinary differential equations analogous to the theory of algebraic manifolds.

Difference equations have been most successfully studied in America by G. D Birkhoff and his students. A particularly significant paper was published by Birkhoff in *Acta Mathematica* in 1930.

Algebra.—Attention has been called in past years to the activity of various mathematicians in the field of modern algebraic theories. It is now desired to call especial attention to the work of A. A. Albert of Columbia University. He has been particularly active in the study of division algebras and allied topics and published several papers during the year.

Miscellaneous papers to which attention is particularly called are: "Some Differential and Algebraic Consequences of the Einstein Field Equations," by K. W. Lamson; "Indefinitely Differentiable and Quasi-analytic Functions," by W. J. Trjitzinsky; "Expansions of Arithmetic Functions in Infinite Series," by R. D. Carmichael; "Plane Transformations Preserving Centers of Gravity," by Lulu Hoffman and "Linear Homogeneous Differential Equations Whose Coefficients are Dirichlet Series," by Samuel Borofsky; "Introduction to the Theory of Non-linear Systems of Plane Algebraic Curves," by J. L. Coolidge.

Research Locale.—The question as to where work is being done is always interesting. A count readily shows that mathematical research is not localized to any one section and the number of papers produced by persons connected with smaller institutions compares favorably with the number produced at the great universities, in spite of the greater handicaps on the worker. If we limit ourselves to the three journals, *Transactions of the American Mathematical Society, American Journal of Mathematics and Annals of Mathematics*, we find that the authorship of the 171 papers which they published during 1930 was distributed as follows: New York 30, California 18, Illinois 15, Texas 11, Massachusetts 11, New Jersey 10, Maryland 8, Connecticut 7, Michigan 6, Indiana 5, Rhode Island 5, Pennsylvania 5, Washington 4, Ohio 3, Kentucky 3, Louisiana 2, West Virginia 2, Iowa 2, Wisconsin 2, Minnesota 1, South Carolina 1, Colorado 1, North Carolina 1, New Hampshire 1, Oklahoma 1, Missouri 1, Canada 2, Foreign 13.

PUBLICATIONS

Noteworthy books published during the year were *Theory of Approximations* by Dunham Jackson, *Topology* by S. Lefschetz, *Infinite Series* by T. Fort, *Introduction to Higher Geometry* by W. C. Graustein, *Projective Pure Geometry* by T. F. Holgate, *Differential Equations* by F. R. Moulton, *Studies in the Theory of Numbers* by L. E. Dickson, *Projective Geometry* by J. W. Young, *A Treatise on the Theory of Determinants* by Thomas Muir, revised and published in America by W. H. Metzler.

Journals.—On account of the ever increasing amount of research the mathematical journals published in America each reached a new size during 1930. *The Bulletin of the American Mathematical Society* published about 1000 pages, *The Transactions of the American Mathematical Society*, 944 pages, *The American Journal of Mathematics*, 922 pages, *Annals of Mathematics*, 726 pages, and *The American Mathematical Monthly*, about 575 pages. It is also to be noted that there are several American journals not devoted exclusively to mathematics, which publish mathematical papers, and that a considerable number of mathematical papers by American authors are published abroad. A new journal was started during the year, under the editorship of Professor H. C. Carver of the University of Michigan. It is known as *The Annals of Mathematical Statistics*. The first number appeared in February. *The American Mathematical Society* has under advisement the establishment of a *Journal in Applied Mathematics*, particularly for problems related to engineering. The committee working on this problem was very active during 1930. It is interesting to note that a mathematical journal has been started in Buenos Aires. It seems to be modeled somewhat after *The American Mathematical Monthly*.

MEETINGS AND ADDRESSES

The American Mathematical Society held meetings as follows: New York City, Feb. 22; Stanford University, April 5; New York City, April 18-19; Chicago, April 18-19; Eugene, Ore., June 20; Providence, Sept. 9-12; New York City, Oct. 25; Columbia, Mo., Nov. 28-29; Los Angeles, Nov. 29; Cleveland, Dec. 29-30. The meeting at Cleveland was noteworthy for the holding of joint sessions with The American Statistical Association. This is a contact which should prove useful to all concerned. At this meeting the annual elections of The American Mathematical Society were held. Dean L. P. Eisenhart of Princeton was elected president.

Expository addresses made before The American Mathematical Society were unusually numerous. The following are noted as seeming of especial interest: G. D. Birkhoff on "Poincare's Last Geometrical Theorem," Oystein Ore on "Recent Developments in Abstract Algebra," H. F. Blichfeldt on "Geometry of Numbers Applied to a Well Known Problem of Diophantine Approximation," Harold Bohr on "Dirichlet Series," C. N. Moore on "Types of Series and Types of Summability," R. E. Langer on "Zeros of Exponential Sums and of Certain Related Functions," M. H. Stone on "Group Representation in Hilbert Space," T. H. Hildebrandt on "Linear Transformations in General Spaces," E. C. Molina on "Probability," and J. D. Tamarkin on "Distribution of Characteristic Values of Linear Integral Equations." This last address seemed particularly significant.

Colloquia and Symposia.—A symposium of a more extended nature was held in New York, April 18 and 19, with addresses on topics in Differential Geometry given by D. J. Struik, W. C. Graustein, T. Y. Thomas and Oswald Veblen. A symposium was also held in Chicago on the same dates led by Henry Blumberg, the general topic being "Methods in Point Sets and the Theory of Real Functions." The Fourteenth Colloquium lectures were given by S. Lefschetz at Providence, September 9-12 on the subject, "Topology."

The Mathematical Association of America holds two general meetings a year and numerous sectional meetings. At each of these meetings there are addresses but of a more elementary nature than those delivered before The American Mathematical Society. There is always at least one address each year given under the auspices of Section A of the American Association for the Advancement of Science.

GUGGENHEIM AND NATIONAL RESEARCH FELLOWSHIPS

The following mathematicians held Guggenheim fellowships during 1930: Prof. A. N. Gandara of the National Preparatory School of Mexico for studies in Differential Geometry and Harmonic Analysis at the Massachusetts Institute of Technology, Prof. H. S. Vandiver of the University of Texas, for research in Europe on Fermat's Last Theorem, Laws of Reciprocity and related topics in the theory of algebraic numbers.

The following are among those who held National Research fellowships in mathematics for at least half of 1930: A. B. Brown, L. W. Cohen, C. C. Craig, Jesse Douglas, H. T. Engstrom, J. J. Gergen, B. W. Jones, N. H. McCoy, Morris Marden, Gordon Paul, W. T. Reid, J. H. Roberts, N. W. Rutt, W. J. Trjitzinsky, Marie J. Weiss.

FOREIGN VISITORS

Among distinguished mathematical visitors to America were: Albert Einstein, Enrico Bompiani, W. Blaschke, Harold Bohr, J. A. Shouten, Karl Menger and T. Radô, Prof. Bompiani bore the title, Visiting Lecturer of the American Mathematical Society. He gave a series of lectures at various institutions during the year. Prof. Radô, formerly of the University of Szeged, Hungary, who has been Visiting Lecturer at Harvard University and at Rice Institute, has been appointed professor at Ohio State University, and will remain in this country.

PRIZES

The Mathematical Association of America awarded its Chauvenet Prize for mathematical exposition to Professor T. H. Hildebrandt of the University of Michigan for his paper entitled, "The Borel Theorem and Its Generalizations," published in *The Bulletin of the American Mathematical Society*, vol. 32, pp. 423-474.

NECROLOGY

The death of Prof. Florian Cajori Aug. 14, was a cause of genuine sorrow to everyone interested in mathematics. He had been a prolific writer on the history of mathematics and through his writings and teaching had done much to stimulate an interest in mathematics and an appreciation of its part in human history. At the time of his death, Cajori was Emeritus Professor of the History of Mathematics at the University of California. During his long life-time, he had held a number of university positions.

E. D. Roe, Jr., died late in 1929. Professor Roe was head of the Department of Mathematics at Syracuse University, where he had been known for many years for his teaching and research and especially for his founding of the Pi Mu Epsilon mathematical fraternity. His death brought sorrow to a wide circle of friends and admirers.

ASTRONOMY

BY BANCROFT WALKER SITTERLY
ASSISTANT PROFESSOR, WESLEYAN UNIVERSITY

GENERAL

The Adler Planetarium in Chicago, located to the east of the Field Museum on the island where are now rising the buildings for the exposition of 1933, opened its doors in May to audiences which taxed the capacity of the building all through the summer. By Sept. 1, nearly 400,000 had attended the lecture-demonstrations of which five were often given in a single day. In galleries surrounding the dome, in which the Zeiss projector displays the motions of the heavenly bodies, are arranged exhibits of ancient and modern instruments and transparencies illustrating the most interesting celestial objects. The instantaneous success of the Planetarium reflects credit alike upon Mr. Adler, the donor; Director Fox and his staff, and the people of Chicago.

Telescopes.—The site of the 200-inch reflecting telescope of the California Institute of Technology has not yet been selected, and observers with instruments especially equipped to test the "seeing" are still making nightly observations in various parts of southern California. Dr. Elihu Thompson and Dr. A. L. Ellis, experimenting toward the production of the 17-foot quartz mirror, have made some very fine twenty-two-inch discs, and will next attempt the five-foot disc which will be the secondary mirror of the great telescope. Meanwhile the laboratory and office building where will be carried on the researches for which the 200-inch will furnish the observational data, is under construction on the Institute's campus in Pasadena.

For a number of years Prof. George W. Ritchey, designer of the 60-inch and 100-inch telescopes of Mount Wilson observatory, has been carrying on experiments in France upon new types of reflecting telescopes, in collaboration with Prof. H. Chretien of the Sorbonne and with the Saint-Gobain Glass Company. It is announced that a telescope of the Ritchie-Chretien type will be set up at Miami, Fla. One of the principal drawbacks to the ordinary reflecting telescope with parabolic and hyperbolic mirors, is the very small field over which images are sharply defined. The new telescope has mirrors especially shaped to remedy this defect, giving a large field of critical definition. The telescope is also extremely compact, being only 54 inches long with an aperture of 20 inches, about half the length of an equivalent instrument of the usual type.

Personnel.—Dr. H. D. Curtis has been appointed director of the Observatories of the University of Michigan, succeeding Prof. R. H. Curtis, who died in 1929. Dr. F. C. Jordan has been named to succeed Dr. Curtis in the directorship of Allegheny Observatory of the University of Pittsburgh.

Upon the retirement of Dr. W. W. Campbell, Director of Lick Observatory and President of the University of California, Dr. R. G. Aitken, long the Associate Director of the Obervatory, has been appointed Director.

The honorary degree of Doctor of Laws was conferred by the University of California upon Associate Director F. H. Seares of Mount Wilson Observatory, and by the University of Indiana upon Director V. M. Slipher and Dr. C. O. Lampland of Lowell Observatory.

MEDAL AWARDS

The Bruce Medal of the Astronomical Society of the Pacific has been conferred for 1930 upon Professor Max Wolf, Director of the Observatory of Heidelberg, Germany.

To Director J. S. Plaskett of the Astrophysical Observatory of the Dominion of Canada, at Victoria, British Colmbia, was awarded the Gold Medal of the Royal Astronomical Society of London for 1930. Dr. Plaskett delivered the annual George Darwin lecture before the Society on the subject: "The High-temperature Stars" (See below).

The American Astronomical Society met in December, 1929 at Cambridge, Mass., and in September, 1930, at Chicago. The sessions at Chicago were held in the new Adler Planetarium.

DISCOVERY OF PLUTO

The discovery of Pluto in February, 1930, was the most noteworthy astronomical event of the year for two reasons; first, because it was in a sense a repetition of the discovery of Neptune (which has been called the greatest achievement of mathematical astronomy), and second, because Pluto seems to be, not a fifth major planet, but a fifth terrestrial planet that lies out beyond the major planets. The discovery was the result of a systematic search by photography initiated by Dr. Percival Lowell at his observatory at Flagstaff, Arizona, in 1905. Analysis of the irregularities in the motion of Uranus had led to the discovery of Neptune, but it did not follow that Neptune was the only disturbing body. In fact, after allowance was made for the effect of Neptune's attraction upon Uranus, there still remained observed deviations of Uranus from the theoretical path which seemed to more than one astronomer too large to be ascribed to errors of observation or computation. Todd, Forbes, See, W. H. Pickering, Lau, Gaillot, and Lowell derived possible positions for a hypothetical disturbing body outside Neptune, the last three using detailed analytical methods. Lowell's investigation was particularly elaborate and painstaking; his final computations, published in 1914, gave two alternative positions for the unknown, on opposite sides of the sky, one of which was not very distant from a prediction of Pickering in 1909, and one of Gaillot the same year. A second prediction of Pickering in 1919 was very close to Lowell's hypothetical place. The planet was searched for at Harvard, Flagstaff, and Mount Wilson, but was not located on any of their photographs. Evidently, if it existed anywhere near the predicted position it was very faint.

In 1929, the Lowell observatory, which had continued the search after Lowell's death, obtained a telescope especially suited for the photography of faint stars, the 13-inch Lawrence-Lowell camera, and on Jan. 21, 1930, an unknown planet was recorded on one of its plates, within six degrees of one of Lowell's alternative predictions and also Pickering's of 1919. It was exceedingly faint, below the fifteenth magnitude. It was soon evident that the planet's distance was not far from that predicted by Lowell, but its motion was so slow that no definite idea could be obtained of the actual elements of its orbit,—a circle and a parabola were fitted with practically equal success to the 1930 observations, by Bower and Whipple of the University of California. But the computations were sufficient to indicate where the planet should be looked for on any photographs of the region which might have been taken within ten or twenty years previous to the discovery, and search was made through the plate files of many observatories. It was soon found on a plate taken at Uccle, Belgium, in January, 1927, on four of the Mount Wilson plates, that had been exposed to find it, in December, 1919, and on two Yerkes Obesrvatory photographs, one of January, 1927, and one of January, 1921.

With observations over a ten-year interval, it was immediately possible to compute a definite orbit. The result was surprisingly close to the predicted orbit of Lowell, the latter's orbit being one-tenth larger and one-fifth less eccentric than the true orbit, and with the major axis in almost the same direction. Pickering's 1919 orbit, arrived at by a method quite different from Lowell's, was considerably larger and somewhat more eccentric than the true one and 55 degrees off in the direction of its major axis, but it was inclined by almost the observed amount and in the same direction. (Lowell did not determine an inclination.) When the two conjectural orbits are placed beside the actual one, it is very difficult to doubt that the body searched for and that discovered are the same.

Yet that doubt has been expressed, and with much reason. The extreme faintness of the object shows that it is either very small, or of astonishingly low reflecting power. The smallest terrestrial planet, Mercury, is about two-fifths as large as the earth; also, its surface reflects light less effectively than that of any other planet. But if Mercury were put in the new planet's place, it would shine almost as brightly as does the planet. It is hard, therefore, to believe that the new planet is as large as the earth, or as massive as the earth (which is more massive for its size than any other planet). Now Lowell assumed a mass for his planet six times the earth's, to account for perturbations of Uranus which were very close to the limit of observation. Could a planet no more massive than the earth, in the place of Lowell's planet, possibly cause observable perturbations? One of the chief living authorities on planetary motion has expressed himself quite positively in the negative. Yet there the planet is!

Several members of the staff of the Lowell Observatory participated in the search, but the actual discovery was made by Clyde Tombaugh, an assistant. The Lowell astronomers gave the body the name of Pluto, god of darkness and brother of Neptune and Jupiter. The most carefully worked out orbits to date, that of Bower ad Whipple, and that of Banachiewicz of Poland, are very interesting. The mean distance of Pluto from the sun is forty astronomical units; that of Neptune is thirty. The corresponding periods are 250 and 165 years. But Neptune's orbit is practically circular and inclined only two degrees, while Pluto's orbit is inclined seventeen degrees and has an eccentricity of 25 per cent,—the kind of orbit that would be expected for a minor planet, but not for a major planet. When at perihelion, Pluto comes slightly nearer the sun than Neptune. This will occur next near the year 1989.

It seems then that we have in Pluto a planet like a terestrial planet, with an orbit like that of a minor planet, at a distance where we should expect a major planet.

COMETS

The first comet of 1930 was discovered by Schwassmann and Wachmann, working together at Bergedorf, Germany, Feb. 18, and independently by Dr. L. C. Peltier, an amateur variable-star observer at Delphos, O., Feb. 19. Peltier has a previous comet to his credit, and the Bergedorf observers several. The comet was faint and showed no unusual features. The second comet, also faint, was found by Max Beyer of Hamburg, Germany, Feb. 26, and independently by Peltier in March. The third comet was detected March 21 by Wilk of Cracow, Poland, discoverer of the last comet of 1929. It was seventh magnitude when found, and became just visible to the naked eye in the last week of March, then faded rapidly. The fourth comet was another discovery of the indefatigable Schwassmann and Wachmann, May 2. Faint when first seen, this comet became a very interesting object. Early in June it passed only 5,000,000,000 miles from the earth. It was not quite of naked-eye brightness, and showed in the telescope a coma about five minutes or 7,500 miles in greatest diameter with a tiny sharp nucleus probably not over a mile across, and no tail. When nearest, it moved on the sky six degrees a day. In appearance and behavior it closely resembled the 1927 apparition of the well-known Pons-Winnecke comet, whose period is about six years, and which has been seen at eleven returns since it was first discovered by Pons in 1819. The orbit also of Schwassmann and Wachmann's comet is rather like that of Pons-Winnecke, and they may well have had a common origin.

Forbes of Capetown, South Africa, discovered the fifth comet on May 31st. He found one also last year, and one the year before. It was faint and without unusual features. The sixth comet was the eleventh return of Temple's second comet (1873); it was picked up by Wood at the Union observatory, Johannesburg, South Africa, Aug. 26, and independently by Van Biesbroeck at Yerkes Observatory, Sept. 22. It was very faint. Two other expected comets, D'Arrest's of 1851 and Daniel's of 1909, were not seen. In November, 1930, a seventh comet was announced, detected by Nakamura in Japan. A photograph of Stearns' comet was obtained by Van Biesbroeck of Yerkes, Oct. 22, 1322 days from the date of discovery in 1927. This is the longest period over which any comet has been observed at a single apparition (it beats Kopff's comet of 1905 by *one day!*) The comet was of seventeenth magnitude.

SOLAR ECLIPSES

Two solar eclipses occurred in 1930, one on April 28, over the United States, Canada, and the north polar regions, and one Oct. 21-22, over the southern Pacific Ocean. The April eclipse was one of those unusual ones where the moon's shadow-cone does not quite reach the earth's surface, except at the nearest part of the track, so that the eclipse is annular over most of its course, but total for a small part of the course. The total part of the track ran across northern California, Nevada, and Idaho, and the maximum duration of totality was one and a half seconds. Parties from several observatories carried out observing programs; these were partially hindered by clouds, but the "flash-spectra" obtained by the Lick and Mount Wilson observers were excellent. Photographs were obtained from an airplane, of the shadow of the moon, less than two miles in diameter, as it sped across the clouds below. To the eye the spectacle was unusually weird, for the "Baily's beads," during the moment of totality, could be seen all around the moon, drowning out the light of the corona for most observers.

The October eclipse began Oct. 21, and ended Oct. 22, for it crossed the International Date Line. Its track passed over no land except the little islands of Nurakita and Niuafoou, near the Fiji Islands. An American party and one from New Zealand established themselves on Niuafoou, and were favored with clear skies and very successful observations. The spectrum of the chromosphere and that of the corona were photographed, and very fine direct photographs of the coronal streamers were obtained. The total phase lasted a minute and a half.

STARS

Steller Samples.—The enormous number of the faint stars makes impossible study of them all individually. It was one of the ideas of the great Dutch astronomer Kapteyn, that investigation should be concentrated upon 206 selected small areas distributed regularly over the sky. Motions, distances, brightnesses, and spectra of stars in these areas were to be intensively observed as a basis for general statistical conclusions. An important contribution to this tremendous program was issued in 1930 by Mount Wilson Observatory,—the photographic brightnesses upon a uniform scale of nearly 70,000 stars, mostly very faint, in the 139 of Kapteyn's areas which were not too far south to be observed at Mount Wilson. The labor was shared by the Kapteyn Laboratory at Gronigen, Holand, where a large part of the measuring of the plates was done, but the most critical part of the work, the reduction of the individual area results to a consistent system, was directed by Dr. Seares of Mount Wilson. For each star the result of the investigation is a single number, the photographic magnitude. A similar undertaking some years ago, by Harvard Observatory and the Kapteyn Laboratory in collaboration, furnished photographic magnitudes for the brighter stars, over somewhat larger areas with the same centers, including the 67 areas too far south for Mount Wilson. A quarter million stars were included. This is the least spectacular kind of astronomical work, and the more than 20 years spent in it may seem disproportionate to the result; but upon no other foundation can far-reaching speculations, of whatever attractiveness, maintain a more than passing importance.

High-Temperature Stars. — The extent to which a careful study of the various aspects of one special problem sometimes sheds light upon other problems, in different directions, is notably exemplified in Dr. J. S. Plaskett's account, before the Royal Astronomical Society of London, of the researches which won him the Society's Gold Medal. Dr. Plaskett has directed for a number of years a detailed study of the spectra of those stars whose color and spectral lines alike indicate unusually high surface temperature. Various methods yielded masses for these stars between five and forty times the sun's, and luminosities between 300 and 1500 times the sun's. The radial velocities obtained from the spectra at the Dominion and other observatories were analyzed to disentangle the individual motions of the stars themselves, the motion of the sun among them, and any other special effects. One special effect has long been known,—a systematic apparent recession from the sun of stars of this type, in all directions. Under Dr. Plaskett's analysis this effect was largely resolved into three parts,—an actual recession of groups of the brighter southern stars, an Einstein effect of the high gravitational force at the surfaces of these unusually massive bodies, and a very definite rotation of the whole system of stars about a very distant center, whose direction agreed well with that toward which Seares of Mount Wilson found that the most distant stars appear to be concentrated, and practically coincided with the direction found by Shapely of Harvard, for the center of the great system of globular clusters. Furthermore, upon the spectra of these stars were superposed lines apparently due to diffuse calcium, spread nearly uniformly through space between the stars, and partaking of the great general rotation. Neither the galactic rotation nor the existence of the interstellar calcium was a "new discovery," but the evidence of this investigation has placed both upon a much firmer basis of objectivity.

The Open Clusters.—Another extensive study of a particular class of objects, which has yielded results of general importance, is the investigation of the loose clusters of stars which are so prominent in the nearer parts of our stellar system, by Dr. Trumpler of Lick Observatory. By classifying these clusters according to the numbers and concentration of their stars, and determining brightness and spectral types of the stars in a number of them, he was able to derive approximate dimensions and locations in space for more than 300 clusters. These clusters were found to form a greatly flattened disc-like system whose plane of concentration was apparently that of the Milky Way, and whose diameter was some 30,000 light-years, the sun being a little out of the center of the system, which is about 1,000 light-years away in a direction nearly at right angles to the direction of the center of the great rotation of the high-temperature stars, but nearly the same as the direction of the center of that great aggregation of the nearer stars which Kapteyn called the "universe" and Shapley the "local system," in distinction from the system of the Milky Way star-clouds and globular clusters. Trumpler is inclined to identify the Milky Way system, the local system, and the system of the open clusters, and to question the reality of the galactic rotation and the great distances found by Shapley for some of the Milky Way clouds, and he suggests that the cluster-Milky-Way-system is a highly resolved spiral nebula which is a unit in a super-system including the Magellanic Clouds and the globular clusters.

Trumpler found that the more distant open clusters were too faint for their size, as compared with nearer ones of similar type. This might be accounted for by supposing that sufficient absorbing material existed in space, to absorb three-fourths of the photographically efficient light which passed through 3,000 light-years of it. Such material might be expected to absorb the blue light more completely than the red, and Trumpler found that this was a fact, distant cluster stars being noticeably redder than similar near ones. Shapley's investigation of the stars in globular clusters showed no trace of this absorption, and Trumpler suggests that it exists only very close to the plane of the Milky Way, which the open clusters frequent but the globular clusters avoid. The material causing this absorption must be of the nature of extremely small dust particles, not separate atoms such as would cause the lines observed in the spectra of the high-temperature stars. But the two kinds of material may be intermingled, for high temperature stars also are very closely concentrated to the Milky Way plane. A study of the blue stars in the Milky Way, by Dr. Van De Kamp of the University of Virginia, has given independent evidence of this reddening of the most distant stars.

THE EXPANDING UNIVERSE

When first the light-gathering power of the great reflectors made possible photography of the spectra of spiral nebulae, it appeared at once that these objects are rushing through space with far higher velocities than any other known bodies, and that their motions are prevailingly recessive. Since the spirals are now believed to be outside of, and independent of, our stellar system,—stellar systems in their own right, probably—their unprecedented speed is not surprising, but it is very puzzling that they should generally be rushing away from the earth. The strangeness of the phenomenon is accentuated by the strong evidence we have at present, that the more distant a spiral is from us, the more rapidly it recedes, in a direct proportionality. The extreme so far is a spiral in Ursa Major, measures of whose spectrum this spring at Mount Wilson indicate that it is receding from us 7,000 miles a second; it is thought to be more than 70,000,000 light-years away.

No known physical force of repulsion exerted by our own stellar system, so far guessed at, could give these gigantic objects such headlong velocities. But it has been shown, particularly in a series of papers by Dr. de Sitter of Leyden, Holland, that under certain ideal conditions the theory of relativity may be extended in such a way as to require that space itself should have a "real" limited extent, an extent, however, which should "appear" to an observer in it as continually increasing; this apparent increase might conceivably show itself as the observed recession of the spiral nebulae. Recent reexamination of this idea by De Sitter himself, Lemaître of Belgium, Eddington of England, and Tolman of California have modified and developed its conceptions to a point where it would appear that the apparent expansion must be also a real one, and that given the observed velocities, not only the "size" but the "age" of the universe and the amount of matter in it may be estimated. The distance across the universe comes out many billions of light-years, and the mass of material in it many billions of billions of times the mass of our sun,—numbers of satisfactory bigness. But the universe seems to be growing old at such a rate that it doubles its size in a few billion years, a time which has been considered short as compared to the lifetime of a single star. Tolman has connected the expansion of the universe with the change of matter into energy which is widely believed to be the source of stellar radiation, but this connection is questioned by Eddington.

PUBLICATIONS

Books.—*Astronomy*, by Prof. R. H.

Baker, University of Illinois (New York, Van Nostrand). An excellently arranged elementary text-book, *The Mysterious Universe*, by Sir James Jeans, Secretary of the Royal Society of London (Macmillan), brilliant discussion of the current conceptions of the universe and their philosophical implications. *Comets*, by C. P. Olivier, Director of Flower Observatory (Baltimore, Williams and Wilkins), a thorough but very readable treatment of comets from all points of view, but especially concerning itself with more recent comets and the more modern work. *Star Clusters*, by Harlow Shapley, Director of Harvard College Observatory (McGraw-Hill), a detailed and rather technical resumé of our knowledge of the clusters, with catalogs of the galactic and globular clusters and a very full and well-arranged bibliography.

Journals.—American observatories either maintain publications of their own, or publish their researches in such technical journals as the *Astronomical Journal* (Albany) and the *Astrophysical Journal* (Chicago); but summaries of their work appear each year in *Popular Astronomy* (Northfield, Minn.), which prints also abstracts of the papers read before the American Astronomical Society and reports of the amateur organizations. Pacific coast observatories and organizations publish also in the *Publications of the Astronomical Society of the Pacific* (San Francisco), and Canadian, in the *Journal of the Royal Astronomical Society of Canada* (Ottawa).

COGNATE SOCIETIES

American Assn. for the Advancement of Science, Smithsonian Institute Bldg., Washington, D. C.

American Astronomical Society, University Observatory, Princeton, N. J.

American Mathematical Society, 501 W. 116th St., New York City.

Mathematical Assn. of America, Oberlin, Ohio.

National Academy of Sciences, B and 21st Sts., Washington, D. C.

Science Service, 21st and B Sts., Washington, D. C.

DIVISION XIX

ENGINEERING AND CONSTRUCTION

STRUCTURAL ENGINEERING

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HIGHWAY BRIDGES OVER MISSISSIPPI RIVER

Recent activity in the construction of long-span highway bridges is shown by the building in the past two years of seven large highway bridges over the Mississippi River. The bridges are: A continuous truss bridge at Quincy, Ill., which has 2 main spans of 627 ft. 8 in. and a total length of 5,000 ft. A simple truss span bridge at Louisiana, Mo., which has 5 spans from 313 ft. to 419 ft., with a total length of 1,673 ft. A simple truss span bridge at Alton, Ill., which has a channel span of 445 ft. and 5 truss spans of 284 ft. A continuous truss bridge at St. Louis, Mo., which has spans continuous over a middle support, the spans varying from 350 ft. to 700 ft. A continuous truss bridge at Cape Girardeau, Mo., which has a main continuous span with 671-ft. spans, and also 4 simple truss spans of 515 ft. A cantilever bridge at Cairo, Ill., which has a main span of 750 ft. and anchor spans of 450 ft. A cantilever bridge at Vicksburg, Miss., which has a center span of 825 ft. and anchor arms of 420 ft. In addition, a cantilever bridge with a center span of 760 ft. and anchor arms of 490 ft. is proposed over the Mississippi River at New Orleans.

TOLLS AND TOLL BRIDGES

Toll Policy In New York.—The New York vehicular tunnel known as the Holland Tube was constructed with money secured by the sale of bonds for that particular project, the tolls to continue until New York and New Jersey are reimbursed for the entire cost. Recently the Port of New York Authority has requested that four tunnels and bridges in New York City be included in one act wherein the tolls are charged on all tunnels and bridges until the bonds have been retired. It would seem to be very much better policy that each particular toll structure should stand or fall on its own merits.

Toll bridges are increasing in number due to the great extension of the public road systems. Aug. 1, 1930, there were 296 toll bridges in operation in the United States. Of this number 96, or 31 per cent, were publicly owned. In addition to the above toll bridges in operation, there were 51 toll bridges under construction in various sections of the United States. In some states, bonds are issued for building the toll bridge. These bonds are secured by the revenue to be derived from the property. The bridge is then built and operated under public supervision until such times as the bonds are paid off, when the structure becomes free to the public.

Canon City, Colo.—The Royal suspension bridge built over the Royal Gorge, at Canon City, Colo., as a toll bridge, has proved to be very popular. This bridge has a span of 1,050 ft. and was erected at a cost of $250,000. The largest returns for any month since opening were in July, 1930, when the tolls were more than $20,000.

San Francisco.—Operation of the San Francisco Bay toll bridge for its first year resulted in a deficit of $232,699, of which $135,700 is a depreciation charge based on the life of the franchise, and $40,258 represents amortization and bond discount and expense. Operating cost and interest on bonds and debentures exceeded the actual income by $56,739. Commercial traffic is increasing and an increase in passenger traffic is expected.

OREGON CONCRETE ARCH BRIDGE

A reinforced concrete arch is being built by the Oregon State Highway Commission over the Rogue River in southwestern Oregon. This bridge has a total length of 1,930 ft. and consists of seven 230-ft. span arches of the open-spandrel type and a 144-ft. span concrete viaduct arch at each end. The bridge has a width of 34 ft. to provide a 27-ft. highway and a 3½-ft. foot-walk. This bridge is being erected under what is known as the Freyssinet method of concrete arch construction. The principal economics and advantages claimed for this method are as follows: (1) elastic rib-shortening and setting stresses may be practically eliminated with reductions in rib sections; (2) by postponing the keying until the temperature of the arch has reached a desirable mean value, temperature stresses may be considerably reduced; (3) secondary stresses due to lateral deflection of the abutments may be practically eliminated; (4) continuity may be developed at the ends and the centers of long spans, thus reducing deflections. In erecting, hydraulic jacks are inserted in the crown of each rib to allow for adjustments. These jacks permit the position of the arch to be maintained or corrected following the construction period until sufficient time has elapsed for the maximum rib-shortening to take place. When the arch is set at exactly the correct position the open section is concreted in. It is estimated that this system will effect a saving of 10 per cent in the cost of concrete.

SUSPENSION BRIDGES

Fort Lee.—The four 36-in. diameter cables of the Fort Lee bridge over the Hudson River at New York City were completed Aug. 7, 1930. These four cables have a total weight of 28,400 tons and are made up of 105,896 individual wires, each approximately one mile long. The spinning of these cables occupied less than 10 months. It is interesting in this connection to note that the four 15¾-in. cables of the Brooklyn bridge, erected in 1883, required 21 months for erection. The four 18¾-in. cables of the Williamsburg bridge were rected in 7 months. The two 30-in. cables of the Philadelphia-Camden bridge were erected in approximately 5 months.

The Ambassador Bridge at Detroit was opened for traffic during the summer. While the heat-treated steel wire cables were replaced by standard steel wire cables the bridge was finally completed ahead of contract time. The committee charged with the investigation of the breaking of the first high steel cables used on the Ambassador bridge has not yet made a report. The completion of the Ambassador bridge, with a span of 1,850 ft., makes it the longest span bridge in the world. On the completion of the Hudson River bridge, the longest span for a bridge will be increased to 3,500 ft. This bridge will not long have the distinction of being the longest span bridge, but will soon give way to the San Francisco bridge, with a span of 4,200 ft.

Poughkeepsie Bridge.—The Mid-Hudson bridge at Poughkeepsie was opened for traffic Aug. 27, 1930. This is a highway suspension bridge with a center span of 1,500 ft. and side spans of 750 ft. each. The bridge was erected by the State of New York and will be operated on a toll basis until paid for.

St. Johns Bridge over the Willamette River at Portland, Ore., is now under construction. This bridge is a rope-strand cable suspension bridge with a main span of 1,207 ft.

STEEL-ARCH AND OTHER BRIDGES

Kill van Kull.—The 1,652-ft. steel-arch bridge over the Kill van Kull between Bayonne, N. J., and Port Richmond, Staten Island, was closed Oct. 4, 1930. The arch is the longest yet built, being 1,652 ft. center to center hinge pins and 1,675 ft. between bearing points on abutments. It was erected by the cantilever method from falsework bents, the closure being effected 250 ft. beyond the center of the arch, a requirement made necessary by the location of the ship channel. The closure of the arch was made on a 16-in. diameter pin in the lower chord.

The Suisun Bridge of the Southern Pacific Railroad is a double-track railroad bridge 6,000 ft. long, being built by the Southern Pacific to replace the present train-ferry service over an arm of San Francisco Bay. Pier foundations for the 530-ft. main spans are being sunk as 40 x 60 ft. open caissons. The internal dredging method is being used to put them down to rock 140 ft. below low water. The main spans have a clearance of 70 ft. above high water, and one lift span will provide a clearance of 135 ft. over the channel. Caissons are built on sand islands made by sinking 80 ft. diameter steel shells into the mud bottom and filling them with sand. Steel work will total 22,000 tons and includes silicon steel and heat-treated eye-bars.

The Vicksburg Bridge over the Mississippi River, was opened for traffic May 20, 1930. The main river crossing consists of a cantilever truss with center span of 825 ft. and anchor spans of 420 ft. and three simple truss spans of 420 ft. This bridge was erected as a private toll bridge and will carry an 18-ft. highway and a single-track railway.

Viaduct.—A high viaduct three miles long has been planned to complete the gap in the Holland Tunnel road system. This bridge will include two double fixed-span cantilever bridges with a clearance of 135 ft. each with a main span of 550 ft. The roadway will be 50 ft. between curbs, sufficient for 5 lanes of travel. The soil throughout the length of the project consists of layers of muck over clay sand and mixed sand and gravel with red rock at depths from 25 ft. to 130 ft. Present plans call for the use of concrete piles for shallow foundations, with pneumatic caissons for depths varying from 90 to 130 ft. The estimated cost of this bridge will be approximately $20,000,000.

George Westinghouse Memorial Bridge over the freight yards of the Pennsylvania Railroad in Pittsburgh, is now under construction. The bridge will have five concrete arches. The center and longest span will be 460 ft. center to center of abutments, with a clear span of 420 ft.

The Longview Bridge over the Columbia River in Washington, was opened to traffic March 29, 1930. This bridge is the longest cantilever structure in the United States, having a main span of 1,200 ft. and anchor arms of 760 ft. The clearances above low water are 185 ft. at the channel pier and 195 ft. at the center of the main span. This bridge was erected by a private corporation as a toll bridge. The bridge carries a 27-ft. roadway and two 3-ft. sidewalks. The trusses of the main bridge and of the 335-ft. approach spans are designed for a live load of 60 lb. per sq. ft. plus impact. The trusses of the shorter deck spans have a live load of 100 lb. per sq. ft. plus impact. The floor system throughout is designed for a live load of two 20-ton trucks, plus 30 per cent impact.

New Orleans.—Plans for a combination rail and highway bridge across the Mississippi River just above New Orleans have been approved by the War Department. This bridge will be built by the Public Belt Railway Commission under the agency of the city. The bridge will be 2,520 ft. in length, and will be a combination of cantilever and simple deck trusses. The channel span will be 750 ft., while two other spans will be 500 ft. in length. Provision is made for an 18-ft. roadway on each side of the main truss and two railway tracks in the center. It is required that the maximum vertical clearance shall be 150 ft. above mean Gulf level.

Floor Slabs.—An experimental floor made of steel grating and concrete and having an area of 500 sq. ft. was laid on the approach of the bridge over Crosswicks Creek, near Trenton, N. J., in November, 1928. This slab is similar to a light floor slab designed for the Delaware River bridge. Tests of slabs for the latter bridge made at Washington show great efficiency in distribution and strength of slab. The Delaware River bridge slab weighed 85 lb. per sq. ft. without asphalt surface. A bridge slab laid in New Jersey by the New Jersey Highway Commission weighs 57 lbs. per sq. ft. without asphalt surface. The latest reports indicate that this floor slab is giving excellent satisfaction.

TUNNELS

Detroit.—The vehicular tunnel under the Detroit River was opened for traffic Nov. 1, 1930. It is 5,135 ft. from portal to portal, consisting mainly of one 220-ft. and eight 248-ft. tubes sunk for the under-water section, a 440-ft. shield-driven approach on the United States side, and a 1,136-ft. approach on the Canadian side. The tunnel has a 22-ft roadway and an estimated capacity of 1,000 cars per hour in each direction. It was built as a toll project at a cost of $25,000,000.

New York.—Sept. 19, 1930, the War Department approved New York City's plan for the construction of twin vehicular tunnels under the Narrows of New York Bay. The City requested approval of alternate plans of constructing the tunnel by either the shield or trench method. It is estimated that the open-trench method would cost $8,000,000 less than the shield method.

ELEVATED THOROUGHFARE IN NEW YORK

The first section of the West Side elevated highway in Manhattan, New York City, was opened Nov. 13, 1930. This structure is built above the central section of West Street from Canal to 23rd Streets. The plans call for the completion of the highway to connect with Riverside Drive at 72nd Street. The roadway contains two separate lanes each 30 ft. wide. The total length of the structure will be 4½ miles, and it will cost $16,000,000.

SUBWAYS

Chicago.—Plans for Chicago's subway, to cost $45,000,000, have recently been approved by the Board of Local Improvements. The general construction of the subway called for roof and walls of concrete supporting a structural steel frame, and a floor of reinforced concrete designed for an upper pressure of 90 lb. per sq. ft.

New York.—The New York subway, from 1900 to June, 1930, has cost $840,000,000. The combined subway systems have a total length of 216 miles, with 635 miles of single track.

BUILDINGS

Tall Buildings.—While New York and Chicago still lead in the number of very tall buildings, tall buildings are being built in nearly every city of any size in the United States. Recently the building-height limits in Kansas City, Mo., were modified to permit the construction of the 30-story Kansas City Light & Power Co. building and the 26-story Bryant building.

Smith Building at Milwaukee.—A building for industrial engineering research has recently been completed by the A. O. Smith Corporation at Milwaukee, Wis. The building occupies a space of 205 ft. by 170 ft. with an inner court 80 ft. wide and 150 ft. long. The main part of the building is 6 stories in height. The entire framework is made of structural steel with steel floors. The main columns are made of plates and angles and are approximately 35 in. square. These columns are fireproofed with 2-in. metal lath and plaster. The steel floor-beam girders are also hollow and are made of 2 plate girders connected by steel batten plates. The hollow columns and girders contain passages for gas, water, and air. The steel floors are made of 3/16-in. deck plates 6 ft. wide and 20 ft. long, carried on 5 in. I-beams. These plates are electrically spot-welded to the I-beams through 2-in. slots. The floor surfaces consist of concrete 1 in. thick reinforced with steel plates. This reinforcement is made of stamped steel plates from rings 2 in. in diameter and 1 in. deep. These rings are tack-welded to the deck plates. After the concrete has set, the steel rings and concrete are to be finished with a grinding machine. The office floor finish will be 13/16 in. timber block 11½ in. square attached to the steel deck plates with a mastic coat. A large portion of the outside walls is made of steel sash windows. None of these can be opened as the building is to be ventilated mechanically as the air condition requires.

Jersey City Storage Terminal.—The new reinforced concrete freight terminal storage house at Jersey City, N. J., is an 8-story structure 148 ft. wide and 162 ft. long. The building is designed for a load of 350 lb. per sq. in. for the basement, first, and second floors, 300 lb. for the third and fourth floors, and 250 lb. for the fifth, sixth, seventh, and eighth floors. The floor consists of reinforced concrete piles carrying a continuous reinforced concrete mat over the whole area to form the basement floor.

The Empire State Building in New York was erected in six months. This building has 85 stories and contains 57,000 tons of structural steel. The Chrysler Building used 21,000 tons of steel and the 70-story Manhattan -Company Building required 18,500 tons of steel. The Merchandise Mart, in Chicago, the world's largest building, required 54,000 tons of structural steel. The principal roof of the Empire State Building is 1,043 ft. above the curb. It has an airship mooring mast 200 ft. above this point.

OBSOLESCENCE OF STEEL BUILDINGS

The Empire State Building was erected on the site of the old Waldorf-Astoria Hotel in New York City. The first part of the old structure was built in 1891 and the second part in 1895. The structural steel and iron in this building were so well preserved that erection markings were easily readable. Part of the structural steel and iron was painted with one coat of red oxide paint and the remainder with one coat of black paint. The only effect of time was to dull the gloss of the paint. The only effects of corrosion were on four small columns where roof leaks had permitted water to enter the inside of the column covering. Examination showed that corrosion was less than 1 per cent, although the columns had been saturated with water for many years. The excellent condition of the steel and iron work in the Waldorf-Astoria Hotel confirms the report on the structural steel and iron work in the Tacoma Building, in Chicago, erected in 1887 and torn down a few years ago to make place for a modern structure. These examples, together with such notable examples as the Eiffel Tower, in which after more than forty years the steel work is still in excellent condition, would appear to indicate that steel construction when reasonably well protected has an indefinite length of life.

While structural steel and reinforced concrete are to a large extent competitive in the construction of large buildings, there are many buildings in which the most economical solution comes through the use of both materials either in combination or in different portions of the same building. The 27-story Buckingham Building in Chicago has steel built-up columns of H-section as far as the 11th floor. These columns are of constant dimension throughout, 16 in. x 16 in. section. Above the 11th floor the interior columns are of steel to the 18th floor above which are spirally reinforced concrete columns. At the rear of the building reinforced concrete exterior columns are used above the 11th floor. The floor frame consists partly of reinforced concrete beams and partly of steel beams.

AIRSHIP DOCK

The Airship Dock at Akron, O., completed during the past year, is the largest structure of this type in the world and is an indication of the growing importance of lighter-than-air transportation. It was built to house during construction the new navy airship ZRS-4 now being built by the Goodyear-Zeppelin Corporation. The airship dock is 325 ft. wide and 1,200 ft. long and is 197 ft. 6 in. from the floor to the center pin, with a maximum clearance of 180 ft. The framework consists of 3 hinged arches spaced 80 ft. centers and is covered with corrugated 20-gage steel. The building was designed for a dead load of 10 lb. per sq. ft. on the roof, 20 lb. on the laterals, and 30 lb. on the arches. The snow load in combination with dead loads was assumed at 30 lb. per sq. ft. on surfaces having an inclination of not less than 45 degrees, and in combination with maximum wind load the snow load was reduced to 14 lb. per sq. ft. A wind load of 80 lb. per sq. ft. was used for all roofing sheets, purlins, and rafters on the upper portion of the building and 40 lb. on the lower portion of the building. A load of 37 lb. per sq. ft. combined with internal forces of 12½ lb. distributed as indicated by tests made by the model. A direct wind pressure of 15 lb. per sq. ft. was also considered. The model specimens indicated that there was an upward pressure of approximately 15 lb. per sq. ft. on the entire structure.

DAMS

Hoover Dam.—As a safeguard against extreme high water, the Hoover Dam (Boulder) has been increased from a height of 557 ft., formerly proposed, to 582 ft. The 557-ft. dam would provide for a storage reservoir capacity of 26,000,000 acre-ft., while the dam with a height of 582 ft. will provide a storage of 30,500,000 acre-ft. The plans for the Boulder Dam have been completed and invitations have been sent out for bids.

Steel Dams.—Announcement of a proposed steel dam at Minden, Germany, would recall the fact that three large steel dams have been constructed in the United States. The Redridge steel dam for the Copper Range Mining Company, in Michigan, was constructed in 1900. This dam was 480 ft. in length and 75 ft. in height. After 30 years this dam is in first-class condition, although it has been painted only once since erection, and that in 1913. A steel dam was built by the Sante Fe Railroad, at Ashfork, Arizona, in 1898. Recent reports indicate that this dam is still in excellent condition. A third steel dam was constructed in the Missouri River at Helena, Montana. Part of this dam was on a defective foundation and failed soon after completion.

EARTHQUAKE RESISTANCE

The most valuable contribution toward the problem of design of structures to resist earthquakes has been the contribution made by Dr. Naito's report on earthquake damage to buildings in Tokyo, Japan. A study of this report would indicate that most of the damaged buildings had inadequately designed foundations on a very poor material. Buildings that had reasonably good materials designed under best modern practice for the most part suffered relatively small damage. One building with structural steel frame supported on pile foundations suffered no earthquake damage. This building was carefully designed against an earthquake shock and was treated as a rigid structure.

In designing the Pine Canyon dam on the San Gabriel River, Cal., the structure has been designed to resist a horizontal earthquake acceleration of 0.1g. This has necessitated increasing the base width to .8 of the height which adds 9.38 per cent to the volume of the structure. This specification is practically that adopted in Italy for dams designed to resist earthquake shocks.

DEEP FOUNDATIONS

The foundations for the 52-story tower of the Union Station at Cleveland, O., rest on piers sunk 200 ft. to bedrock. The borings of the site showed the following materials: sand and clay, 42 ft.; moist and compact blue clay and sand, 110 ft.; dry, hard, tough clay, 87 ft.; and 4 ft. of similar clay with boulders. The piers were carried down to rock by the open-well system. The wells were 8 ft. 8 in. to 10 ft. 4 in. in diameter and were sunk in 6 ft. lifts and were lined with hardwood staves and steel ring braces. The wells were filled with concrete. As the cost of excavation was about as much as the cost of concrete a concrete mix of 1:1:2 was used with a stress of 750 lb. on concrete not reinforced and 1,000 lb. under steel bases where the pier top was reinforced by hooping and vertical bars. Gas was encountered in practically all wells.

WELDED STRUCTURES

Flame-cutting Steel.—There has been a very decided difference of opinion among engineers as to the result of the practice of flame-cutting structural steel. Tests made at Columbia University would indicate that flame-cutting has a very harmful effect, while other tests would indicate that flame-cut steel might be used with safety. Little definite information can be obtained from random commercial tests of specimens of flame-cut structural steel.

New Buildings.—During the past year a large number of buildings have been erected with welded connections. Among these are the Homestead Hotel, Hot Springs, Ark., an 11-story structure; a power house 150 ft. high at Atlantic City; a 14-story steel office building for the California Edison Company, Los Angeles, Cal.; and, more recently, a 19-story office building in Dallas, Texas.

Welding Tests.—A large number of physical tests have been made on welded joints and considerable progress has been made in developing standard specifications and methods of testing. An attempt has also been made to develop rational methods for the design of welded joints in steel structures. The limited number of fatigue tests on welded plates and shapes appear to indicate that the endurance limit of welded joints is probably not more that one-half of the endurance limit of the unwelded steel. Before welding can be generally adopted for all types of structural steel, it will be necessary to carry research investigations far enough to remove the design and construction of welded structures from the present position of empericism.

ENGINEERING RESEARCH

Dead Weight Reduction.—One of the most important elements in the design of bridges, buildings, and other structures, is the reduction of the dead weight. Very thin slabs have been used on the Philadelphia-Camden bridge and on the Ambassador Bridge. Considerable advance has recently been made in reducing the dead weight of floors in office buildings. In lighter-than-air flying crafts, it is very important to reduce the dead weight to a minimum. Aluminum alloys have given very successful results in the design of dirigibles, but this solution of a very difficult problem is not yet entirely satisfactory. Aluminum steel alloys are not a satisfactory building material, due principally to the fact that the modulus of elasticity of aluminum alloys is approximately one-third that of steel and that aluminum alloys may be seriously affected by corrosive influences. The enthusiasm of the aluminum alloys advocates is indicated by the fact that structural aluminum alloy shapes are now available on the market. This would appear to be an excellent illustration of an industry trying to tempt the public to make a large use of a product in a field where its use is questionable.

Concrete.—The importance of light-weight building materials is indicated by a program of the next meeting of the American Concrete Institute. This entire program is to be devoted to light-weight concrete.

Anniversary at University of Illinois.—Attention was called to the rapid growth of engineering research by the celebration of 25 years of research by the Engineering Experiment Station of the University of Illinois, held at Urbana last May. This celebration was held at the time of the dedication of the new Materials Testing Laboratory, which contains a 3,000,000-pound Universal testing machine that is the largest testing machine of its type in the world.

Wind Pressure Tests.—Experienced engineers have at various times experienced considerable doubt as to the value of wind tests made on models in an air tunnel. The tests made for the design of the airship dock at Akron and also the tests made to determine wind pressures on vertical cylinders by the Bureau of Standards at Washington were made with Pitot tubes. The use of these tubes for determining wind pressure is open to considerable question. The Pitot tube gives correct results only when it is in line with the direct flow of the air current. Where the current blows across the tube the results will be entirely useless. The absurdity and the uselessness of the results obtained in model tests are well illustrated by tests made at the Bureau of Standards on wind pressure on vertical cylinders. These tests indicate a positive wind pressure on the windward side and a negative wind pressure on the leeward side quite in accordance with current opinion. In addition, however, they indicate a very large negative pressure where the wind is tangent to the cylinder. These apparent negative pressures are undoubtedly due to the air blowing across the mouth of the Pitot tube and give results that are fallacious and absurd. It would appear very evident that model tests so far have contributed very little to our knowledge of wind pressures on structures.

Timber.—While timber has been used as a building material from ancient times, less is known about its properties than about the properties of steel, concrete, and other materials. The competition of other building materials is making it necessary for the timber manufacturers to carry on research work if timber is to continue as a building material. Coöperative investigations are now in progress in the Engineering Experiment Station of the University of Illinois on the strength of timber arches, and on the distribution of concentrated loads on timber floors. It may be interesting to know that timber floors in many cases are lighter than any other available material for equal strength and deflection.

Embrittlement of Galvanized Steel.—Structural engineers have been aware for many years that galvanized structural steel was in many cases unreliable. A special committee has recently been formed by the American Society for Testing Materials to make a study of embrittlement of galvanized structural steel. The breakages of the heat-treated steel wire cables used on the Ambassador and Mount Hope bridges may have been due to the galvanizing process.

Thick and Thin Structural Steel.—Recent tests made by a committee of the American Society for Testing Materials show that thin steel is more ductile and has a higher elastic limit than thick steel. Very thick steel in some cases gave indications of lamination.

Reinforced Concrete.—An extensive series of tests of reinforced concrete columns is now being made at the University of Illinois and at Lehigh University. A coöperative investigation of concrete and reinforced concrete arches between the U. S. Bureau of Public Roads, the Engineering Foundation, the American Society of Civil Engineers, and the Engineering Experiment Station of the University of Illinois is now being carried on at the University of Illinois.

MECHANICAL ENGINEERING

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And

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INTRODUCTORY

The year 1930 opened with a black cloud on the business horizon. At the beginning hope ran high that this portended merely a short storm, but as the months passed it became evident that we were facing not a quick-passing flurry but a steady and possibly long depression. In so far as mechanical engineering was concerned this had two opposite effects in the various fields of the subject. On the one hand utilities had the advantage of extremely cheap money which became more plentiful as the year wound up to a close. At the same time considerable pressure was brought upon them by public opinion, and by local and Federal governments to spend money in order to create a market for goods and relieve unemployment. While the pay-load of the public utilities has been of course affected by business conditions, it did not suffer from the depression quite as much as the industrial concerns. During the year, therefore, a considerable amount of building in power stations and distributing systems has been going on which helped the progress of mechanical engineering as such.

The strictly industrial concerns were faced with a different situation; namely, a decrease of business with the prospect of a vast increase in competition even after business should have picked up. It was incumbent upon them, therefore, to prepare for this coming competition which meant modernizing of plants and equipment and finding ways of cutting costs and expenses to the bone. Fortunately for the country the depression came after several years of prosperity, at a time when the majority at least of the large concerns were in an excellent financial. condition, many indeed with large cash resources and no bank loans. They, therefore, had the money to make the necessary expenditures so that as a result of the two tendencies outlined above, while production was lagging behind, developments in the field of mechanical engineering were vigorously pushing ahead. This advance was not, however, so much along radical lines of research as by way of that kind of improvement and refinement in design which is capable of bringing a quick profit. In the present review use has been made of Progress Reports presented by some of the Professional Divisions of the National Engineering Societies represented on the Advisory Board of The American Year Book.

POWER PLANT ENGINEERING

Water-power Fuel-energy Competition.—According to the annual report of the Federal Power Commission competition between water-power and fuel-generated energy is already keen. Even in the regions of abundant water reserves the steam-electric plant is assuming a position of rapidly increasing importance and is demonstrating its capacity to compete on even terms with hydro-power. The production statistics for 1929 show for the first time in ten years a failure of the hydro-power to record a gain in output. During the same period the energy manufactured by fuel plants increased by 10,000,000,000 kw.-hr.

Consumption of Electricity.—The same report points out that the per capita consumption of electricity was reported to have increased from 391 kw.-hr. in 1920 to 800 kw.-hr. in 1930 and the report adds that it is significant that in general the regions having the highest per capita consumption are also those in which a large proportion of the energy is generated from water power sources.

Investment Gain.—Matthew S. Sloan, President of the Brooklyn Edison Company, and others called attention to the fact that the investment in power systems per units of capacity and of earnings is increasing, probably due to the introduction of all kinds of refinements in design.

Industrial-utility Coöperation.—The matter of relations between industrials and utilities is becoming of increasing importance and its recognition led to the promotion of methods of coöperation between the two. As a result of such coöperation, utility power plants adjacent to industrial concerns, as for example at Deepwater, N. J., and Baton Rouge, La., furnish process steam and by-product electrical energy for the use of industrials.

Boilers and Accessories.—As regards purely mechanical progress, there has been no radical change in types of fuel preparation and burning equipment but flexibility of both has improved, permitting burning of different fuels and of various grades in the same furnace particularly in combinations of oil and gas fuels. Fuel burning equipment boilers and boiler accesories have become available that permit an output of

1,000,000 to 1,500,000 lb. of steam per hour from a single generating unit. The increasing boiler pressures have been noted before but for some time steam temperatures in this country have been limited to a maximum of approximately 750 deg. f. Quite lately a tendency towards higher temperatures has become manifest and superheater manufacturers are ready to guarantee their equipment for temperatures up to 850 deg. f. using plain carbon steel for the superheater tubes. Increased use is being made of steaming economisers particularly in high pressure installations. In England a question even arose where the field for the boiler ends and that for the steaming economiser begins. The clue to the answer lies, of course, in the substitution of the lower cost heating surface of the economiser for the higher cost boiler heating surface. Furthermore, the exit gas temperatures resulting from the high pressure now used and the high boiler output obtained call for the use of an economiser between the boiler and air heater as the boiler exit gas carries too high a temperature for the air heater.

Pulverized Coal Burners. — In the field of pulverized coal burning, the unit system is making progress. In general, however, the low range of pulverized coal burners as well as of oil and gas burners with satisfactory operation is still undesirably limited. A high percentage reduction from maximum boiler output may mean either damage to boilers from overheating or a reduction of boiler efficiency resulting from the cooling air put through the burners. One of the most interesting developments in the past year has been the introduction of vertical compound and triple tandem compound turbines. The vertical compound turbine generators for 1,200 lb. pressure range from 25,000 to 110,000 kw. and the triple tandem compound units up to 150,000 kw. in size. In the early slagging furnaces using powdered coal, trouble developed due to the gradual expansion of the refractory lined bottom. At the State Line generating station this difficulty has been overcome by the use of a water cooled floor construction with the hearth of magnesite ore. Considerable improvement in the combustion conditions with stoker-fired boilers has been obtained by means of properly proportioned water cooled protecting walls and arches. A further development in boiler furnaces is represented by the recently installed furnace at the Lakeside Station of the Milwaukee Electric Railway and Light Company. In this furnace two sides are cooled by high pressure steam passing through two inch tubes.

Mechanical Stokers.—Great efforts have been made to perfect the details and increase the capacity of mechanical stokers. The steam, hydraulic, and electro-hydraulic drives introduced in the last year are lending themselves better to the highly developed automatic combustion control. The movement of fuel in the underfeed types is now subject to a closer adjustment, and new forms of tuyeres for pre-heated air have been developed. The use of larger stokers has resulted in problems of automatic control of air to the various sections of the stoker. An installation of the Detroit Edison Company designed to control the flow of air to a stoker 57 tuyeres long by 14 retorts wide has given satisfactory results. The largest underfeed stokers ordered recently for boilers of 500,000 lb. steam per hour capacity are 69 tuyeres long and 15 retorts wide, with a fuel-bed area of 694 sq. ft. Chain-grate stokers have reached widths up to 23.5 ft. The improved grating allows greater pre-heating of air and more even and complete combustion of poorer grade coals. However, their progress is much slower than that of the underfeed type.

Combination Burners.—The great increase in the consumption of natural gas, most of which is used for industrial purposes, has led to improvements in gas burners. Inasmuch as the gas is frequently burned in conjunction with fuel oil or pulverized fuel, the fuel used at any time depending on the market, more attention has been paid to combination burners which will handle gaseous, liquid, or pulverized solid fuel. At the present time burners are available which will handle either gas, oil, or coal at rates of heat liberation of over 100 million B.t.u. per hour. In some installations these burners have been used successfully with air preheated up to 900 deg. fahr. The use of gas or oil as a stand-by fuel is popular, and under these conditions the burners must be exceedingly flexible in their operation. A recent installation provides for a change from practically no load to full load in 40 seconds. At the new electric station of the Louisiana Steam Products Company, refinery sludge is being burned with mechanical-atomizing burners. This is the first time that this has been done successfully with such burners. At the same plant the combination burners are handling natural gas, fuel oil, and petroleum coke.

OIL AND GAS POWER

Diesel Drive.—While there has been a great increase in the use of Diesel engines, at times in rather unexpected places (for example, in the power plant of a West Virginia coal mine where steam power might be expected to show to best advantage), there have been few important improvements in the design of the engines. From the point of view of new installations, the one at Hudson, Mass., is of interest because the Diesel engine has been adopted after a very careful analysis of other forms and has not only shown improved economy but also great quietness in operation. In the marine field, bigger and better Diesel driven vessels are built. Among other things, the use of Diesel engines has already enabled freighters to increase speed materially. The motor ship, *Amerika*, equipped with double acting two-stroke mechanical injection engines, is reported to have shown an overall fuel consumption of 0.365 lb. per brake hp. which is certainly a remarkable record. In THE AMERICAN YEAR BOOK for 1929, p. 593, it has been reported that the power plant of the German cruiser, Ersatz Pressen, is of the order of 17 lb. per hp. It has been since found that the weight is 50 lb. per shaft hp. which is still a remarkable figure. As regards stationary Diesel engines, the tendency is to reduce their weight as much as possible, among other things, by increasing piston speeds which are now approaching a standard of 1200 ft. per minute. In Europe in marine engines supercharging is increasingly employed and several systems have been successfully used. Exhaust heat recovery and the use of the two cycle double acting type are also on the increase. For a recent installation in Argentina an interesting horizontal type engine has been used. Reference is made also to the development of Diesel engines for aviation and for use in automobiles.

HYDRAULICS

Question of Water Power Development.—There was a time when it was assumed that it would pay to develop any large source of water power providing it was near enough to industrial regions to make it possible to dispose of the power generated. As time went on and the efficiency of the hydro-turbines increased there seemed to be more and more support for this view. The development of the propeller turbine, which made it possible to utilize economically low heads, seemed to place hydraulic power in a still stronger position. Of late, however, the supremacy of white coal as a source of cheap power has been powerfully challenged by steam, and the report for 1930 of the Federal Power Commission devotes a good deal of attention to this subject of competition between motor operated and steam generated power. There is every indication that the day is not far off when it wil pay to develop only those sources of water power where the initial investment is particularly moderate. A further handicap in the development of water power is imposed by the fact that in many states it has become a subject of controversy of a political nature.

Technical Developments.—From the technical point of view there is a strong tendency towards larger and larger power units and to the simplification of design, together with the use of automatic operation, division of load between units, and automatic control of the frequency of the current generated. The use of larger units justifies the installation of each unit with its auxiliaries and transformers as a single unit feeding a single transmission line with means of cross connection or interconnection between the units resulting in the utmost simplification in layout and equipment as well as minimum cost of construction and maximum reliability and ease of operation.

Research in the field of hydraulics is very active, several notable laboratories having been constructed within the last year. The projected National Hydraulic Laboratory is now about to become an actuality and will be charged with the duty of investigating the fundamentals of hydraulics and of pursuing hydraulic experiments at the request of the various government departments.

Turbine Developments.—One of the most interesting is the Kaplan turbine at Spiers Falls, N. Y., as well as the Dnieprostroy and the Dnieper in Russia. The use of the axial-flow or propeler-type turbine has increased the speed of rotation and correspondingly reduced the cost of generators. The use of rolled steel and welding in generator construction is increasing more rapidly as time goes on, resulting in great economy in cost and speed of construction, as well as decreased weight. Each machine, in a sense, becomes special without increase in cost, except for the making of a few detail plans, thus resulting in real economy all around.

The umbrella type of generator is being more generally used, and its vertical height has been still further reduced by installing the combined thrust and guide bearing within the lower generator bracket rather than on top of it. The use of tungsten carbide tools has increased the speed of machining, while various developments and researches in the punching and machining of generator and turbine parts and the use of hydraulic pressure in coil forming, etc., have resulted in generators and other equipment having closer clearances and better efficiency being produced at less cost. Recent research has also resulted in better insulation materials and in the determination of the voltage conditions in generator coils which have a decided bearing on the possibility of utilizing higher generator voltages than the maximum of 13,800 volts now customary. Because of the increase in the size of units closer regulation has become more and more important. This is done by more intensive use of indicating devices and telemetering as well as the use of the automatic operator. The problem of obtaining power from the tides seems to be approaching a practical solution in Europe.

MACHINE SHOP PRACTICE

Improvement In Tools.—Business in machine tools in 1930 has been slow and yet it was quite generally expected that not only would it pick up at some date not too distant but that there would be a big demand on the part of such industries as railroads and automobile manufacturers. It was also expected that when this demand came competition would be very keen with the result that practically all the leading companies have been utilizing the comparative dullness in business as an oportunity to improve their product. A large amount of research and experimental work has been, therefore, going on but comparatively little of it has been announced to the press.

Tungsten Carbide.—There has been further active work in the development of applications of machine tools with tungsten carbide as a base. During the past year the material has been employed in heavy machine tool work. The application of these tools has not been uniformly successful which would indicate that either this material has a certain range of application only, or else that the failures where they have been found are due to a lack of data on the methods of using this new cutting material or the machines used in the experimental work were unsuitable for the use of this alloy.

Precision Methods In Production.

—The constantly increasing degree to which precision methods are being applied in mass production is significant. Finer cuts and higher degrees of finish through the supplemental application of superfine abrasives have been the great contributing factor to what might be called quantity precision which is quite commonly measured now in ten thousandths of an inch and even finer tolerances are not unusual. The indication is that certain developments in the electrical industry such as the photoelectric cell and the thyratron will soon find application in the machine tool industry as they are already finding application in rolling of steel and drawing of wire.

Tool Embellishment.—It was not so long ago that the following lines expressed the universal belief of both the general public and the trade:

"Fast upon the solid rock their ugly houses stand,
Come and see my shining castle built upon the sand."

The houses standing upon solid rock were assumed to be ugly while the shining castle had to be upon a foundation of sand. We are rapidly getting away from that and, for example, in the field of machine tools there either has developed a pronounced tendency to have them not only rugged enough to withstand such strains as are wrought upon them by cutting at the speeds permited by Carboloy but also to make them objects of beauty. This is partly done by the decided effort to improve the lines but also by the use of of such finishes as chromium and nickel plating and particularly employment of color. This latter has, of course, been made possible by the development of cellulose base finishes which permit the application of color quickly at a comparatively low cost and the production of a finish that will stand up under the hard wear and tear of a machine shop.

RAILROAD ENGINEERING

Transportation Changes and Competition.—If we read the signs of the times aright, there is going to be great excitement and deep changes in transportation circles within the next few years. The past year saw the laying of the foundations for what may become an entirely new era in railroad transportation. The impending changes have been forced by competition and development of new methods of conveying passengers and freight. The movement originated long ago but seems to be now rapidly coming to a climax. To put the matter in a nutshell, passenger transportation by railroads is too slow and in places too expensive, while freight transportation suffers from lack of flexibility and high charges both in straight transportation and in terminal deliveries. Development of handling goods by trucking on one side and the growth of buses and aeroplane lines on the other side is increasingly being felt by the railroads which it would now appear, are not going to take it lying down, but will fight for their existence.

Buses and Airplanes.—In particular, in the field of passenger traffic, the inroads made by automobiles have been a factor in railroad economics for a considerable time. Within the last two years, however, the main problems of transportation by bus in an efficient and comfortable maner have been apparently solved while the level of rates is sufficiently below that offered by railroads to attract the patronage. Airplane traffic is also showing indications of rapid growth. As far as volume is concerned, the loss of traffic to aeroplanes appears to be negligible today, but it is there, is increasing, and may acquire formidable proportions with the further development of the planes themselves and the ground organization.

Railroad Improvements.—The way the railroads are meeting these problems is significant. On one hand a steady effort is being made to improve the comfort of traffic by introducing, for example, a new type of day coach which, when room is available, makes it more convenient for the pasenger to sleep at night than in the conventional coach. Another way to meet bus competition is by creating a second class fare offering to the pasenger at the lower rate of fare the same comforts as first class and depriving him only of certain minor advantages. A still further inducement to travel by rail is offered by a vigorous effort to increase the speed of rail traffic. Improvement in road bed rails to some extent, and ability to discover hidden flaws in rails, may have a good deal to do with this. On the electrified roads very much higher speeds are of course obtainable than on steel roads and, for example, the Pensylvania Railroad is said to contemplate a time table based on the speed of 90 miles an hour as soon as the New York to Philadelphia line has been electrified. A much more radical departure from conventional practice is being, however, developed in Europe where the tendency is to adapt aeronautical inventions to rail traffic. A zeppelin-like propeller-driven car has been tried out in Germany, while it appears that a more easily applicable scheme has been tried out by George Bennie near Glasgow, Scotland. In the Bennie system, the car is suspended from a single overhead rail but driven by air propellers through an electric motor. It permits the car to attain extremely high speeds. The scheme is based apparently on sound engineering principles and does not sacrifice safety. Since its first trial, the Blackpool Corporation of England undertook to build a line including a bridge across the Ribble River, while another company is contemplating similar construction in France. In the Bennie plane an overhead trestle would have to be built, the freight continuing to move on existing rails; the passengers going by the car or train suspended from the bottom of the trestle, while the upper level would be nicely concreted and used as a motor highway thus making automobile traffic, which is today a straight competitor of railroads, pay them a toll for the use of the elevated highways. Just what will be the effect of this new method of transportation on the future development of aeronautics is a matter deserving of of the most serious consideration.

Locomotives.—In the field of mechanical engineering new designs have been coming at a great rate. In America, an interesting new type of locomotive has been built by the American Locomotive Company jointly with the Timken Roller Bearing Company and is equipped on all axles with roller bearings. It is expected that this locomotive will permit faster driving with less trouble in the bearings and higher mechanical efficiency. In the field of high pressure steam locomotives, the Delaware and Hudson Company has put into service one carrying 500 pounds steam pressure. The London and Northeastern put in one with a pressure of 450 pounds fitted with the Yarrow type boiler. The New York Central is having a multi-pressure three cylinder locomotive built to carry a pressure of 1400 pounds in the closed circuit contained in the water tube system serving the fire box while two other circuits will carry respectively 800 pounds and 250 pounds steam pressure. A still higher pressure is carried by a Löffler type locomotive built in Germany (1700 pounds).

Car Refrigeration.—As regards rolling stock, the refrigerating art seems to have had a predominant influence. The Baltimore and Ohio placed in service a dining car in which the temperature and humidity of the car are controlled within certain limits in addition to which all air admitted to the car is filtered. A similar car was placed in service by the Atchison, Topeka and Santa Fe Railroad. An iceless refrigerator car has been successfully tested between the State of Washington and New York City with an outside temperature varying between 6 and 50 deg. The temperature of the fruit in the car was held between 31 and 33 deg. for 13 days. The refrigerator is provided by a silica gel system operated by alternately lighting and extinguishing gas burners at proper intervals.

Couplers.—Important tests on couplers were carried out in the last year. The Baltimore and Ohio Railroad tested the O-B tight-lock coupler in an endeavor to develop an automatic tight-lock coupler which could be used satisfactorily with connections for steam, air-brake, air-signal, and electric systems. It was desired to combine all these connections between cars in one structure so that when the car couplers were unlocked, the valves in the steam and air lines would close automatically and at the same time open the electric circuits. It was desired to supply a continuous source of electric energy from a central generating unit in sufficient quantity to provide for the operation of the air-conditioning equipment, electric refrigeration, vacuum cleaners, hot-water heaters, cigar lighters, window-operating devices, coffee percolators, and other devices. The generator consists of a 60-cycle, 220-volt alternating-current steam turbo-generator of 25 kw., mounted on the front of the locomotive.

REFRIGERATION

In the past year refrigeration continued its advance forward becoming one of the major industries. While domestic refrigeration had been firmly established before, the past year saw two important developments in this field. One is the discovery of a new refrigerant agent, dichloro-difluoro-methane—which combines the element of safety with that of efficiency as a refrigerant. The other development had to do with a wide introduction of gas refrigeration by the Munter and Platen method; that is, in an apparatus without a compressor. The same essential process has been semi-commercially at least applied to electric refrigeration. In the field of refrigeration generally a development which may become of the greatest importance has to do with the refrigeration of foods, particularly meats, where it has been discovered that foods can be preserved practically indefinitely providing that, to start with, they are quickly frozen to a very low temperature. This has already led to an effort said to have been successful in at least some sections of the country to sell meat in cuts made at the plant and wrapped in transparent paper or an equivalent material. When domestic refrigeration had been first developed to the commercial stage, it was expected that it would find an extensive application for air conditioning in buildings, particularly in the tropics. Only few instances of this, however, have so far become known. On the other hand, in the past year it has been applied to dining cars on Pullman trains; that is, in what might be called as a pure luxury field. It is said that mechanically it has been quite successful. Tunnel type refrigeration for freezing fish has been successfully applied in a number of cases. In this system of refrigeration the fish is placd on pans which are then floated on a deeply cooled brine until completely frozen.

IRON AND STEEL

Production.—The iron and steel industry was badly hit by the depression of 1930, the ratio of production in the latter part of the year having fallen below 40 per cent. The only bright spot in the industry has been the production of large pipe and seamless-tubes for natural gas and oil pipe lines. A still larger potential market has come into sight through the development of gasoline pipe lines in which a start has been made during the past year. This demand has been met partly by electrically welded tubing and partly by the production of very large seamless-tube mills. Two firms have put into operation seamless-tube mills for making tubes up to 24 in. in diameter. It is said in the industry that they are still having trouble doing it. In electrically welded piping one company put up a big mill to make pipe on the resistance method; another one opened in October a mill to weld pipe by the induction method and a third well-established concern has been trying out flash welding to replace arc-welding which they are regularly using.

Use of Gas in Open-hearth Furnaces.—In the open-hearth furnace field the use of mixed gas in the open-hearth has attracted considerable attention. To provide coke-oven gas one company in the Pittsburgh district laid a 48-in. pipe from its by-product coke-ovens to the steel mill and has resorted to storing excess coke-oven gas in abandoned natural-gas wells thereby obtaining at cheap cost a large storage capacity. The furnaces themselves have been improved by the introduction of a movable part and application of automatic control as well as the use of devices to meter the air and fuel supply.

Stainless Steels and Irons.—The use of stainless steels and irons for architectural decorative purposes and for automobile trim has grown, well-known instances of its application being the top of the Chrysler Building and the Ford radiator shells. The stage has not yet been reached, however, where the actual load-carrying members of structures can be made of corrosion-proof steels; meanwhile increased attention has been given to reducing the corrosion of ordinary steels. The United States Steel Corporation has reached a production basis on corrosion- and heat-resistant low-carbon steels. The problem of buffing and polishing stainless-iron parts by automatic machinery seems to have been solved; this was the main obstacle to rapid extension of the use of the material in this country. Stainless alloy steels of the maganese-copper-chromium type have been developed for work requiring the deep drawing of sheets, and two different types of free-machining stainless steels have been produced for use in parts requiring machining. These are said to be equal to screw stock in free-cutting qualities.

Centrifugal casting of steel billets has been operated during the past year on a commercial scale. The Ordnance Department of the Army has continued the development of the casting of guns by the centrifugal process, and has adopted it for the making of small-caliber guns for the Army. Rustless-steel pipe have also been made by the centrifugal-casting method.

Alloy Steels.—There has been an increased use of alloy steel for forgings, both of stainless and of other alloys; and a further application of quenching and tempering of alloy steel castings. In England, Hadfields have developed a nickel-chromium-tungsten steel for gas-turbine rotors. In this country a nickel-molybdenum steel has been produced for great strength at high temperatures.

TEXTILE ENGINEERING

Conditions and Improvements.—Considering the large number of persons employed in textile engineering and the distribution of the products of the industry, and the fact that a substantial share of the average person's income goes for clothing which all consists of textiles, the public has been surprisingly ignorant and lacking in interest as to what is going on in this industry. There was a time when the industry was extremely profitable though the labor conditions and rate of wages were about as bad as bad could be. Then, without the fate of labor being improved, the industry ceased to be profitable and as a whole seemed to be facing impending bankruptcy. Quite recently the leading men have realized that one of the main troubles with the whole textile industry is, one might say, that it has been asleep at the switch and while in all other industries machinery and maintenance have been rapidly improving they were largely stationary in the manufacture of textiles. In the past year textile machinery manufacturers were comparatively idle and hence had time for perfecting new ideas. The result of it is that a number of improvements have been brought out. Not only that, but some have been sold to manufacturers and others are likely to be.

Pick-and-pick Loom. — Perhaps the outstanding innovation in weaving machinery is the automatic pick-and-pick loom. This loom permits the shifting of the shuttle at either end of its travel so that a single lay of filling may be made, whereas, its predecessor could not lay less than two. Thus is made possible the weaving of certain fabrics which were impossible on the previous automatic loom. To accomplish this result has necessitated a radical change in the bobbin-changing mechanism and magazine.

Rug and Carpet Weaving.—One of the interesting developments in weaving is the progress in making so-called American-Oriental rugs which now supply a large part of the domestic demand for "Orientals." By the employment of a modified Axminister weaving the pattern can be brought through to the back as in true Oriental production. While on the subject of carpets, one of the outstanding textile-engineering achievements has been the production of a loom that will weave a carpet 20 ft. in width. This is truly a monster machine, weighing upward of 50 tons. It is driven by two motors placed at opposite ends and working in perfect synchronism. Electric control embodying solenoid brakes gives easy control, and automatically pressure-lubricated bearings give smooth operation.

Cotton and Yarns.—In the field of cotton machinery one of the principal advances is the continued gain in popularity of the one-process picking, a process which makes picking and cleaning of cotton entirely automatic. Present day machinery is permitting spinning of finer yarns than ever before. One American manufacturer has announced that he was going to specialize on counts from 140s to 200s. Formerly, yarns as fine as these have been supplied from England.

Rayon and Silk.—The progress has been particularly rapid in the field of rayon and silk, especially the former. Fabrics formerly considered as standard silk constructions have been imitated most successfully. The production of finer yarns with differing degrees of lustre and the development of yarns with varying degrees of twist have made this possible together with the use of cross-dyeing. Furthermore rayon has been produced in which the individual filaments of the yarn are actually finer than the individual filaments of real silk. This has been possible, of course, only by the appearance of twisters of improved design. Machines are now available to produce tram, organzine, crepe and grenadine with twists varying from one to eighty turns per inch. These are double-deck machines where each deck can be controlled independently of the other.

Tests and Research.—Improved machinery and methods of production led to the adoption of the use of improved methods of control. The microscope is now in daily use. A new testing machine is now available for determining the comparative wearing qualities of various fabrics and the job of the husband sent by his wife to match a piece of ribbon has been lightened by the development of an application of the photoelectric cell by means of which it is now possible to telegraph color measurements from place to place or, in other words, to match shades by wire. During the past year two major agencies have been created for the purpose of furthering research in the textile industry. One of these is the United States Institute for Textile Research and the other, the Textile Foundation created by the Merritt bill to administer in textile research the major portion of the fund of $1,800,000 derived by the Textile Alliance from the sale of German reparation dyes.

ELECTRICAL ENGINEERING

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INTRODUCTION

Technical Progress.—There were no strikingly new advances of major importance in the field of electrical engineering in 1930. Technical progress consisted chiefly of improvement of existing apparatus and the obtainment of new knowledge concerning problems previously under investigation.

The Power Field.—The more important technical topics of discussion were transformer ratings, lightning investigation and the protection of lines and apparatus, dielectric research, relaying and system planning. From the economic viewpoint principal discussions in this field centered about decreasing income per dollar invested and load building. The light and power utilities were the object of much political discussion preceding the fall elections.

Illumination Engineering.—Illumination engineers carried on a rather interesting debate with architects concerning the value of the illumination engineer in building design. The medium was the *Electrical World*, and the controversy was started by an article by a prominent architect decrying the illumination engineers' knowledge.

Telephony and Radio.—The most interesting advances were the extension of the telephone service to South America and to ships at sea. Television was improved. The year marked the advent of the RCA-Victor Company into the radio manufacturing field.

SYSTEM ECONOMY AND PLANNING

Ambassador Sackett's Address.—At the World Power Conference held in Berlin in June, the American ambassador, F. M. Sackett, delivered an address in which he criticized the price of electricity to domestic consumers in America and suggested that the Federal Government own and operate an experimental steam plant in an attempt to cut distribution costs. Mr. Sackett's speech was in turn severely criticized as to its accuracy by several prominent utility executives, but since the ambassador was formerly president of a utility, and hence spoke with some authority, and since he admirably outlined a much discussed problem, the following excerpt from his speech is worthwhile irrespective of the absolute accuracy of the figures used:

"I know no other manufacturing industry where the sale price of the product to the great mass of consumers is fifteen times the actual cost of production. My purpose is sharply to define a weakness that calls for the keenest thought in your deliberations. Until the power business is brought into line with other industries in the relationship of its cost of production to the price paid by the consumer, there can be little justification for the thought that this great power industry is rapidly approaching perfection.

"Whether electrical energy is produced from water power with its standby plants or by modern steam units, you have by constant improvement driven down thus far the cost of electricity until it can be fairly said an economical station produces current at from 0.3 to 0.4 per kilowatt-hour. In most great centers of population, in America at least, consumers pay for household service at around 6 cents per kilowatt-hour, fifteen to twenty times its cost. Such a discrepancy between the production cost and the delivery price gives a wide field for study by the distribution engineer.

"It gives little satisfaction to the great mass of household consumers to point to the high construction costs required to serve the small user, to urge the large reduction in the price that is made for quantity service through a single installation or even to call the roll of reductions in delivered prices that have followed through the years. The fact remains that there is an extraordinary margin between the cost and the sales price, to the reduction of which science may apply itself with greatest benefit to the people as a whole. . . .

"I have taken occasion to draw this parallel between cost and sale prices with a view to a situation which should claim the attention of the utility interests in America, where power development is almost exclusively in private hands. There exists in America a rapidly growing body of public opinion led by laymen of great ability which is demanding governmental competition in rates with private power enterprises. So drastic is the demand that it vocalizes with the thought that all water-power forces should be government owned and operated. This public clamor cites with enthusiasm the delivered cost of certain municipally owned systems in neighboring countries as proof of the iniquity of charges for electricity by our privately operated plants. . . .

"The parallel just drawn, showing a proportion of fifteen to one between the cost of the product and the sales price, would seem to indicate that the experiment of reducing costs by government operation can be fully tried by limiting it to the operation of any modern steam plant with its distribution system. The complete experiment need not involve the subversive principle that the government should own and operate the water-power sources of electricity."

Editorial Comment On Distribution.—*The Electrical World*, commenting editorially on the speech, said, "His [Ambassador Sackett's] intimate knowledge of the technology and economics of electric service prompted him to contribute . . . a solemn emphasis on the prime handicap of the electrical industry—distribution costs." The same magazine later suggested that since 70 per cent of the 30 per cent of all electrical energy generated which does not get to the customers' meters is lost in the distribution system, it might be well to spend more on the engineering of the distribution system than on that of the generating and transmission systems. At present the engineering costs have a ratio of about three to one in favor of the generating and transmission systems. From data compiled by the National Electric Light Association, it has been shown that whereas power plant unit cost has been reduced, there has been an increase of 40 per cent in the unit cost of transmission and distribution services and substations in the last decade.

Investment Increase and Rates.—W. A. Jones, president of the N. E. L. A., presented another view of the situation when he pointed out that the investment per dollar of annual gross revenue was $4.72 in 1922 and $5.64 in 1929, an increase of 19 per cent, whereas in the same period the average rate per kw.-hr. decreased 8 per cent. (Efficiency of production has increased, however, so that comparison is difficult. Net revenue per dollar of capitalization has increased and investment per kw.-hr. sold has decreased.) Of the 20,000,000 domestic customers in this country, about 6,000,000 are served at a loss and 2,000,000 more are non-profitable. Mr. Jones suggested the fixed service charge and greater use of electricity as a solution. It has been suggested that increasing unit investment costs are due in part to adherence to a "classic style in design and construction," and to lack of standardization in generating stations, transmission lines, distribution system, etc. Manufacturers have stated that 1,200-lb. steam boiler, turbine and generator sets could easily be adapted to outdoor installations, which would save housing costs and make expansion simpler.

Statistical Analysis.—For the power industry as a whole, statistics show that since 1920 costs have increased 128 per cent, gross revenue 130 per cent, energy generated 130 per cent and number of customers 150 per cent. One important fact is that whereas the portion of gross income of hydro plants required for operating costs has remained approximately constant in the decade, changing from 43 to 39 per cent, steam plants have reduced this from 62 to 47 per cent. Indications at the end of the year seemed to point to a total energy output not much greater than that of 1929. (For statistics see article on Electric Light and Power, Division VIII.) A symposium of the American Institute of Electrical Engineers showed that three large cities, Chicago, Philadelphia and Detroit, had similar systems of planning in general but different methods of connecting parts of the system to the whole, the Chicago system being rigidly interconnected, the Philadelphia system having tight coupling between power zones and generating stations but ability to cut off any faulty part quickly, and the Detroit system having loosely coupled power zones, each with its own generating station. The New York City system was described in the 1929 AMERICAN YEAR BOOK.

System Stability.—Analysis of (interconnected) system stability has been simplified to such an extent that analyses are now made by the utilities just as they now make short circuit studies which at one time were thought highly theoretical. Various types of apparatus for improving stability and controlling power flow are in use, such as series capacitors in transmission lines and phase-shifting equipment to correct differences in phase of the currents in two lines which are connected. The most important development, however, is that of high speed relays and circuit breakers which, with an overall relay and breaker operating time of 0.1 second, will greatly increase the stability of a system.

Division of the load among plants of an interconnected system is an important economic problem. There are three methods of solving it in common use: (1) load the best station to its maximum, then the next best station, etc.; (2) load the best station to its "best point," then the next best to its "best point," etc., or sometimes, bring all stations up to their best loads concurrently; (3) the incremental method, which is based on the principle that, with certain apparatus at work, the next increment of load shall be picked up by that group of boilers, turbines and auxiliaries which will supply the new load at least cost. Obviously the latter method requires consideration of a huge number of factors, which could not possibly be studied and considered by a load dispatcher in the available time. An instrument has been described to enable a system to take advantage of the incremental method. The interesting thesis has been advanced that good system power factor is not necessarily the best for a large interconnected system in which stability is one of the main objectives and absolute continuity of service another. There is no reactive capacity available if station and load equipment are working at unity power factor, and stability calls for sufficient synchronizing power to be available in time of trouble. Hence it might pay some utilities to accept moderate power factor from industrial customers without penalty.

British Distribution Plan.—The British grid scheme, inaugurated by the electricity supply act of 1926, has now reached a stage of completion which warrants a brief discussion of the plan. A board known as the British Electricity Commission acts as middleman in the sale of electrical energy, purchasing the energy from central stations and selling it to retailers or distributors. Inefficient stations are forced out of action, because energy purchased from large and efficient stations is offered for sale by the Commission at a lower price than the cost of production in the inefficient station. Hence the utility formerly owning a low-efficiency station becames simply a distributor, purchasing the energy it sells from the Commission, which owns only transmission lines and associated apparatus. The scheme has attracted world-wide attention, and repercussions have been felt in the United States. It has been suggested that despite the huge amount of interconnection between utilities (which forms an effective grid), such a system might be used to tie utility systems in with industrial plant systems, particularly since the British scheme provides for marketing of dump or by-product energy. With sufficient diversity, industrial plant energy now wasted might be made to supply part of a utility's load. This is no more than a suggestion at the present, but the interconnection of utility and large industrial plant electric systems has been much debated in recent years.

LOAD BUILDING

Family Consumption.—Load building has been discussed in the AMERICAN YEAR BOOK in the last few years; it continues, quite naturally, to be an important topic of discussion among those interested in electric power utilities. Off-peak energy, which, it is generally conceded, costs little more than the price of the fuel required to generate it, is being urged for such domestic applications as house heating, hot water heating, etc. Some utilities are paying installation costs of electric ranges. Nevertheless, in spite of all efforts to increase the domestic use of electricity, it is still stated that, "as a potential market for electrical energy the American home continues to hold out possibilities far in excess of present achievement," and the domestic load averages 500 kw.-hrs. per year per residential customer rather than the 4,000 kw.-hrs. proposed as a "desirable" average. (See 1929 AMERICAN YEAR BOOK.)

Farm Electrification.—About 560,000 of the 6,000,000 farms in America were electrified at the beginning of 1930, hence "the admission must be made that farm electrification in national aspect is not yet very far along in its program. . . . executives are still afraid of the business."

Industrial plants are now using purchased electricity to such an extent that potential loads may mostly be considered marginal loads. To attract some of these, various schemes have been suggested, such as supplying steam to industrialists now generating electrical energy because it is economical when a large amount of steam is also needed. Electric heating has made extensive headway in the last few years, but of an estimated potential market of about 95 billion kw.-hrs. per year in this particular field, only 6 billion is developed. In general, electric furnaces are not as economical as open-hearth furnaces.

TURBINES AND GENERATORS

The trend in large steam plants is toward the use of 1,250-lb. steam at 825 degrees F., with resuperheating, feed-water heating and multiple bleeding. This is not the case for small and medium size stations with low load factor. It is predicted, however, that the development of drumless steam generators will make high pressure steam economically available for small industrial plants.

The tendency in turbine design is toward increased unit capacity, giving more capacity per unit floor space and reducing turbine and building costs, and toward operation on more efficient heat cycles. The Hartford Electric Light Company has issued a report on the 10,000-kw. mercury vapor generator installed as an experiment several years ago. The report states that the average consumption was 10,000 B.t.u. per kw.-hr. in 90,000,000 kw.-hrs. output. Economically, the boiler would wipe out its excess cost in three and one half years. In the last six years of experimental work there were no cases of mercurial poisoning. Certain organic compounds, more easily and cheaply obtainable than mercury and with better physical properties, have been suggested as substitutes.

To carry peak loads, it has been suggested at various times that Diesel engines, hydraulic storage and steam storage be used. All such apparatus is special, and uneconomical when through growth the peak of one time becomes normal load of another. A steam turbine in which the high pressure section may be by-passed can carry 60 to 100 per cent more load than its most economical rating. Having generators with maximum capacity, increasing the capacity is of comparatively small cost. Furthermore, the extra capacity is available for emergency service at all times. Hence this method of caring for peak loads is coming into use.

There were several 160,000-kw. and 110,000-kw. turbo-generators being manufactured during the year, and manufacturers are prepared to supply single unit generators with ratings up to 200,000 kv.-a., or 250,000 kv.-a. with hydrogen cooling. Most of the large generators are of the double-winding type. One of the 110,000-kw. units has a turbine of the vertical-compound type, with high-pressure element mounted above the low-pressure, thus saving floor space.

With main generating units of large size there is some question as to the value of the generator bus, some favoring its abolition. Load transfers are then to be made at the high tension terminals of the transformers or at a switching substation.

In view of the trend toward direct connection of machines to line, the question of the protection of windings against surge voltages has become important. Protection methods adequate for transformers are insufficient for generators due to the limited slot space and the impracticability of padding end turns. Tests have shown that the most effective protective device now available is the lightning arrester, which, however, only limits the magnitude of the voltage impressed on the machine. To better this, capacitors in parallel with the lightning arrester are used to protect the insulation between turns. In addition various other means of protection are required.

The Southern California Edison Company reports for the full year 1929 an average consumption of 12,848 B.t.u. per net kw.-hr. output of one of its 100,000-kw. single-shaft turbo-generator units (one of the first installed.)

HYDRO-ELECTRIC PLANTS

South.—Water power is being developed in the south more rapidly than in any other part of the country, and there is now almost as much capacity in hydro plants in the south as in the far west. In the last five years, hydro capacity in the south has increased from 20.1 per cent to 28 per cent of the country's total, whereas that in the far west (Pacific coast and Mountain districts) has changed from 32.6 per cent to 33 per cent of the total. Steam is economically overcoming water for most new projects on the west coast, and even in the south the need for ample steam reserves was emphasized in 1930 by a severe drought.

Northwest.—A study of rainfall records covering a fifty-year period of a certain region in the Pacific northwest shows a steady decline in the average rainfall over that time, so that the normal for 1930 is about 70 per cent that of fifty years ago. The matter is of course of considerable economic significance, for a hydro plant which might justify itself on the assumption of a given average rainfall may not be economical for an average over its life of six inches less.

Kaplan Blade.—The first Kaplan automatic adjustable blade waterwheel installed in this country has shown an efficiency of 10 per cent better than a stationary blade waterwheel. The Kaplan blade has an arrangement for adjusting the angle of the blade with gate opening to get highest efficiency. It has been used in new European installations for some time, as has been another new turbine, the Propeller.

Hoover Dam.—Boulder Dam has been renamed Hoover Dam, and an appropriation of $25,000,000 for carrying on the work (now provided for by an initial $10,600,000) will be in the Federal budget, to become available June 30, 1931. Contracts for the sale of electrical energy generated at Hoover Dam to various public and private agencies have been signed, and the Federal government seems launched on a utility career to some extent. Arizona is contesting the constitutionality of the Boulder Dam Act.

Muscle Shoals.—Government ownership and operation of Muscle Shoals may become another Federal business project, if indications of December 1 are correct. In the latter case, there will be no social cloak corresponding to the irrigation and flood control features associated with Hoover Dam, and the electric utilities are (naturally) strongly opposed to the Norris bill providing for government operation.

Federal Power Commission.—Congress approved a bill providing for the reorganization of the Federal Power Commission, which in the future is to be composed of five commissioners rather than three cabinet members.

Water Temperatures.—The difference of temperature of water near the top and at great depths in the sea has been successfully used to develop electric energy, and a commercial plant utilizing this principle is projected.

TRANSMISSION, LIGHTNING INVESTIGATIONS AND INSULATION

Lightning investigations are still being conducted and reports form an extensive part of present-day electrical engineering literature. Two new lightning arresters are the thyrite and the porous block. The first uses thyrite, a newly developed substance with good insulating properties at some potentials and good conducting properties at higher potentials. The porous block arrester uses slightly conducting porous material, discharges being thus confined to narrow passages. Good valve action is obtained, since it has been shown that there will be no appreciable current flow through such a material when the voltage across it is less than the breakdown voltage; above this voltage the current flows easily. It is now suggested that direct lightning strokes are responsible for transmission lines going out of service, and induced voltages are comparatively of less consequence. Experimentally measured direct-stroke voltages run up to 4,500,000 volts. One significant sign is the undercurrent of opinion that lightning will be mastered economically as well as physically in the near future. An experimental installation of forty-foot wood poles on top of line towers to carry ground wires is of interest. The ground wire is to receive direct strokes, and the forty-foot spacing is needed to prevent flashover to line wires.

The rationalization (or coördination) of system insulation has received much consideration. Well insulated lines may be connected to transformers which, if their insulating properties are not greater, will break down before the line flashes over. This is one of the many problems of rationalization which are being discussed. High-voltage insulators have been improved in several details.

Dielectric research is veering from the obtaining of empirical rules to the study of physical fundamentals. There are three popular and different theories current to account for the behavior of dielectrics, none of which seems to explain experimental data completely. Insulating oils have received some intensive study. Corona loss measurements show the loss to be erratic, to decrease when grease is on the wires and to be changed more by weathering than by roughening the surface.

Wooden pole lines have been improved in design and are returning to their former popularity. An almost radical proposal concerning steel tower lines was the suggestion that the towers be made simply of two posts hinged at the bases and at the cross beam, and suitably guyed.

There has been some discussion of high voltage d.c. transmission. The French inventor Thury, whose high voltage d.c. scheme involves the use of motor generators in series, claims that for distances above 300 miles d.c. transmission can be shown to be the more economical. D.c. transmission over 400 miles, using thyratron tubes, has been studied in model. The Baum principle has again been proposed for long lines, of which the stability is a most important characteristic. Series synchronous condensers have been suggested for improving line regulation and series capacitors have proved themselves.

A new high voltage underground cable has a semi-conducting, highly absorbent paper surrounding the central conductor. This can be shown, theoretically, at least, to improve the high voltage insulation qualities of the cable.

TRANSFORMERS AND MACHINERY

For several years it has been suggested that transformers should be loaded according to temperature rather than rating; that is, if the maximum safe temperature of a transformer is 95 degrees C., then irrespective of its rating the transformer may be loaded until some part of it reaches a temperature of 95 degrees C. There has been considerable argument on both sides of this proposal. The first commercial lightning tests on transformers were made using 3,000,000-volt surges.

Other developments of the year included an experimental proof that the exterior color of a transformer has little effect on its temperature; installation of large non-resonating transformers in which internal voltage stresses are greatly reduced by the use of electrostatic shields; the burial of distribution transformers directly in the ground rather than in vaults; extension of economical load ratio control to low-current transformers; development of methods of grounding the neutral of a transformer bank through an impedance so that system short-circuit currents may be limited and the effects of transients on the transformer not be increased; and building of a current impulse transformer for the generation of high-current transients.

Protective devices have come in for their usual study. The deion principle (AMERICAN YEAR BOOK, 1929) has been extended in slightly modified form to the conventional type of oil circuit breaker of any voltage and capacity; the air jet breaker (AMERICAN YEAR BOOK, 1929) has successfully broken a 1,500,000 kv.-a. circuit at 100 kv.; the Petersen coil, widely used in Europe, is still discussed in American publications but not used in the United States; detailed slow-motion pictures of a 24,000 kv.-a. arc at 8,000 volts have been taken; one company has considered some of its short transmission lines as bus extensions and eliminated breakers and the companion disconnect switches on the lines; the choke coil has again been proved to be useless for the protection of station apparatus, and exception has once more been taken to the proof; under some conditions it has been shown that shunt resistors might improve the action of choke coils; the design of metal-clad switchgear is undergoing refinement and standardization, and the switchgear is being more extensively used; a single-tank three-phase circuit breaker, capacity up to 1,000 kv.-a. at 100 kv. has been developed in Germany.

The Rossman method of speed control of a.c. motors, originally devised for controlling fans, etc., in power plants, seems to be superior in several respects to other methods now in use. The new system makes use of an a.c. motor, both the rotor and frame of which may rotate.

The mercury arc rectifier (see under Railroad Electrification), in which the chief improvements in recent years have been with regard to backfire protection and voltage regulation, may have a serious competitor in the new mercury jet wave rectifier. This is a mechanical device in which a stream of mercury is caused to "follow" (in space) the variation of the a.c. to be rectified, alternately making contact with two electrodes of a transformer tapped at the midpoint. Some of these new rectifiers (200 kw.) are in service in Copenhagen. They have high efficiencies over a range of 20 to 120 per cent of full load.

INSTRUMENTS AND MEASUREMENTS

High-speed relays have been developed so that, with new high-speed breakers, a faulty section of line may be cut out in .01 second or less, thereby increasing system stability since the power which may be transmitted over a line without the system becoming unstable is approximately proportional to the time required to isolate a fault on the line from the power source. In time of trouble, ground current almost invariably flows, and in consequence of this newly discovered fact, ground relaying is becoming important.

New watthour meters maintain their accuracy at 200-300 per cent overload, and have improved accuracy under conditions of varying voltage, frequency, temperature and power factors. Since such meters are usually carefully adjusted so as not to overcharge a customer, errors are usually in favor of the customer, and the slight inaccuracies of the old meters could easily result in a 2 per cent loss of revenue by the utility.

Photography.—A cathode ray oscillograph which allows pictures to be taken in air is a huge advance over the vacuum photography hitherto necessitated. Using an exciting voltage of about 70 kv., the electron stream is allowed to impinge on an electron-permeable window (thin aluminum or cellon foil) in the tube wall, past which the film is drawn outside the tube. The cathode ray oscillograph is much used in lightning investigation.

A new telemetering system employs a vacuum-tube beat-frequency oscillator, the output frequency of which is controlled by a small condenser whose reading is to be transmitted. The reading is reproduced at the receiving station by a frequency meter with scale corresponding to that of the transmitting oscillator. The system has very few contacts or moving parts and its accuracy is not affected by changes in impedance of the transmission channel.

Miniature Instruments.—There is a strong tendency toward the use of miniature instruments—now coming out of the developmental stage—and small compact switchboards containing miniature control as well as indicating apparatus. Metal switchboards are becoming popular.

ILLUMINATION

Coöperation with Architects.—William Van Alen, architect of the Chrysler Tower, New York City, said in an interview published in the *Electrical World*: "Coöperation with the men of the electrical industry would be more welcome if, speaking frankly, they knew what they were talking about." This remark elicited many replies from illumination engineers, from whose point of view—as well as from that of some architects—it appeared that Mr. Van Alen had encountered a series of unfortunate coincidences. In spite of his criticism, architects and illumination engineers are beginning to work together harmoniously, and several joint meetings of architects and engineers, also training classes for each group in the other's specialty, were held during the year.

Color-lighting.—There have been several important applications of color-lighting effects recently. Totally enclosed rooms (such as a hotel ballroom in one instance), with no windows or wall decorations, have varying colored patterns thrown on the walls by concealed lights. This idea of "color painting" may possibly soon become an important factor in interior decoration.

Gaseous Discharge Lamps.—Dr. C. C. Paterson, president of the Institution of Electrical Engineers (England), predicts that the future will see gaseous discharge lamps (such as neon lamps) used for lighting. The great concentration of light at the filament of a tungsten lamp is inimical to aesthetic use; gaseous discharge lamps do not have this characteristic.

Motion Picture Improvements.—Two important improvements of light sources were made for the motion picture industry. The use of larger screens and the probable perfection in the near future of stereoscopic projection led to the production of a superior carbon arc of great intrinsic brilliancy, using current of 225 amps. A method has been devised for silencing the usual carbon arc, allowing its return to the studios from which it has been barred since the advent of sound pictures.

Ultra-violet radiations are being used extensively in therapeutic and commercial applications. A new tungsten-mercury arc lamp, with a bulb of special glass which transmits light waves below the visible range, has been produced to supply ultra-violet radiations. It is similar, in its commercial form, to an ordinary incandescent lamp.

Lighting of athletic fields for night time competitions has been appreciably extended during the year.

Chicago Lighting Institute.—A lighting institute for the public demonstration of illumination effects has been opened in Chicago under the auspices of a group of electrical manufacturers, utilities and contractors.

RAILROAD ELECTRIFICATION

There were no new large railroad electrifications announced during the year. The Pennsylvania has begun electric operations of local trains between Philadelphia and Trenton and has completed the electrification of all its Philadelphia suburban lines. Electrification is now going forward on the stretch of the Philadelphia-

New York line between New Brunswick and Jersey City. The Delaware, Lackawanna and Western has placed in service part of the new electrification of its suburban New York lines. The Reading Company will have in operation by July, 1931, a portion of its newly electrified system outside Philadelphia. The Illinois Central, which recently electrified part of its Chicago yards, has announced that it will complete the electrification of all its lines within the city limits. The Pennsylvania plans to electrify its line to Washington and ultimately its main line west from Philadelphia as far as Atglen, as well as its low-grade freight lines between the Susquehanna River Valley and the eastern terminals. It is predicted that the Reading will electrify its Philadelphia-New York line. The Cleveland Union Terminals Company has almost completed the electrification of the Cleveland Union Station and lines entering it. The 3,000-volt d.c. system is used, motor generators being utilized for the conversion of a.c. to d.c.

The above electrifications well illustrate the diversity of opinion which still exists as to whether direct current or single phase alternating current is better for railroad use (if either may be said to be better in general). The Pennsylvania and Reading systems are 11,000-volt, 25-cycle projects, whereas the Lackawanna is a 3,000-volt d.c. system; the latter is, incidentally, the first large suburban electrification using this. Power is supplied to the catenary in the Lackawanna case from substations in which mercury-arc rectifiers exclusively are installed for conversion of alternating to direct current. (Rotary machinery is being hard pressed by mercury-arc rectifiers in conversion work, partly due to the fact that the rectifiers, in the Lackawanna case to take a concrete example, can withstand loads of one and one-half times rating for two hours, three times rating for five minutes and six times rating for fifteen seconds. They operate at high efficiency and almost unity power factor. Some are rated at 3,000 kw. Outdoor mercury rectifier substations are predicated.) In Europe, the 3,000-volt d.c. system and a 1,500-volt d.c. system are apparently finding favor. The state-owned lines of Italy, which have a three-phase a.c. system in certain sections, have turned to 3,000-volt d.c. in their most recent projects. In France there is a comprehensive plan for all railroads, covering a period of twenty years, which calls for the electrification of about 5,500 miles of lines exclusive of those in the Paris suburban area. It specifies the use of 1,500 or 3,000 volts d.c. This scheme is to be pushed.

According to one manufacturer, typical locomotives for the 11,000-volt single-phase systems will have two driving axles and three driven axles, motors rated at 1,400 h.p. but capable of developing 2,000 h.p. for short periods and corresponding locomotive speeds of 90 m.p.h. This is in part an answer to bus competition, etc., and to the need of greater capacity on certain stretches of road.

Oil - electric - battery locomotives known as "three-power" units are becoming popular. These operate either from third-rail or overhead supply, or from the battery, a Diesel engine being used to drive a generator to charge the battery. A locomotive designed for switching in industrial plant yards, which requires only one man for its operation and has a simplified control, was exhibited during the year.

LOCAL TRANSIT

Street Railways.—There has been a great deal of activity in the street railway field during the last two or three years, the tendency being toward high-speed motors of larger capacity than those formerly used, lighter cars and higher rates of acceleration necessitating the development of new control system. A variable automatic control operated by either hand or foot has been developed.

Buses.—The trolleybus is enjoying new popularity; it is the latest version of what was formerly called the trackless trolley, but instead of being a trolley which does not run on tracks it is a bus operated by motors which receive their energy from two overhead wires. It is apparently justified economically on light traffic routes and has many advantages over the trackless trolley which was tried out in eight cities but is now in use in only four of those eight.

COMMUNICATION

International Telephony. — The most outstanding advances in the communication field during the year were the inauguration of telephone service between the United States and Argentina, Chile, Uruguay and later Australia, and the introduction of ship-to-shore service. The United States may now be connected with thirty countries located in all the continents of the world except Asia, and the year witnessed the initial step in the extension of transoceanic service to the far East. Request has been made for a permit for a short-wave radio telephone station in California and it is expected that by 1932 Honolulu will be connected with the United States. The long-wave and short-wave transatlantic telephone service has been augmented by the addition of two more short-wave circuits. The average number of calls is now fifty per business day. Work is going forward on the transatlantic telephone cable (not subject to the inherent uncertainties of radio) and a second long-wave transatlantic radio telephone circuit.

Ship-to-shore telephone experiments were first tried in December, 1929, and the service is being extended to most of the large ocean liners. Short waves are being used but different wave lengths are required for optimum transmission at different times of the day and for different distances of ship from shore.

Telephone Statistics.—There were more than 20,200,000 telephones (16 per hundred inhabitants) in the United States on Sept. 30, 1930, of which more than 5,000,000 were dial telephones, an increase of about a million in the last year. Completed telephone conversations averaged 82,900,000 daily, of which 3,500,000 were toll and long distance calls. The average time of connection has been reduced from 7.5 minutes to 2.4 minutes in the last five years. In the last decade the number of telephones in use in the United States has increased almost 7,000,000 or about 52 per cent, and the average number of daily conversations has increased more than 31,000,000 or 60 per cent. Of these conversations, almost 2,000,000 were in toll calls, representing an increase of 120 per cent. Among the feature stunts of the/ year may be mentioned telephone communication from a moving train in Canada to London, and between an airplane (in this country) and Europe. Commercial apparatus is now available for telephone service between airplanes and the ground. The apparatus is the result of long studies in which such difficulties as noise and short antennae have been overcome.

Television. — Two-way television has been successfully demonstrated, as has television in color. This means that it is now possible, although as yet probably not economically practical, to see and hear the speakers at both ends of a telephone line. There have been improvements in details and the images are now reproduced more exactly. In one demonstration life-size images of the performers were reproduced.

Sound motion-picture systems have been steadily improved. In recording, the improvements in quality have resulted from better pickups and electrical circuits, better optical systems in the case of film recording, and refinements in the photographic processes for handling films. Special re-recording apparatus has been developed. Both the disc and the film methods of recording sound continue to be popular. In projection, improvements have resulted from better loud speakers and better driving mechanisms.

New Devices.—The Southern California Edison Company is making use of an adaptation of the pilot wire relay circuit in which carrier current has replaced the relay pilot wire. This same company has developed a device known as the "serj-detour" arrester, which is designed to protect the communication system of the company (wire system) from disturbances caused either by contact of a telephone line with a high tension line or by voltage induced in a telephone line due to surges in the power line. The arrester, which depends for its action upon the fact that between two highly polished and perfectly parallel silver surfaces of two electrodes an arc spreads uniformly over the entire surface of each electrode face and so has no tendency to concentrate at one place, protects the communication system without taking it out of service.

RADIO

The Radio Corporation of America was reorganized and became a manufacturing company, taking over the radio manufacturing business of the General Electrical Company and the Westinghouse Electric and Manufacturing Company through its subsidiary, the RCA-Victor Company, which absorbed the old Victor Talking Machine Company. The new magazine, *Electronics*, under the editorship of O. H. Caldwell, former member of the Federal Radio Commission, began publication in April. It is a trade magazine and is meant to be in the radio field what the *Electrical World* is in the power field. There is a section, "Radio," in the AMERICAN YEAR BOOK (Div. XIII), in consequence of which further discussion of this division of electrical engineering here will be limited to noting that the applications of the vacuum tube to control and regulatory problems in the power field are increasing rapidly, so that H. B. Smith, president of the A.I.E.E., has predicted ". . . as the result of the tube's advent, we are likely to witness a complete redesign of our electrical systems in many respects." Photo-electric cells are continuing to be increasingly applied to industrial uses.

STANDARDS

The A.I.E.E., in the interests of coöperation, has declared that, " . . . the Institute, in general, will refer to that body [the American Standards Association] the consideration and approval of standards in which it is interested." Since at one time the A.I.E.E. was the sole standardizing body in the electrical engineering field and since, not so long ago, it reiterated its claim to the exclusive right of setting such standards, this change in viewpoint is looked upon as distinct progress in coöperation in standardization. There is a section in this volume on industrial standardization and further discussion will be found there.

The International Committee on Weights and Measures has adopted a resolution advising the use of the absolute system of electrical units for all scientific and industrial measurements. A. E. Kennelly, chairman of the sub-committee on magnetic units of the International Electrotechnical Commission, has made the following suggestions: that the proposal of the Italian delegation in 1927 for a "practical" unit of magnet flux equal to 10^8 c.g.s. units be adopted but that it not be called the "Maxwell" as was proposed by the Italians; that before any new action is taken, definitions of many magnetic quantities should be internationally standardized so that there will be agreement as to the dimensions of permeability, and that the names of some few of the magnetic units be revised.

MISCELLANEOUS

Welding.—During the year two large firms tacitly approved of arc welding for structural work. One announced that it had decided to make welding or riveting of new buildings optional with the owner. The other stated its conviction that the code should accept welded boilers. The Boiler Code Committee of the American Society of Mechanical Engineers has issued tentative specifications for the welding of power boilers. A new type of arc-welded steel floor, which uses steel plate tying beams together, may become important in the building industry.

New Developments.—Some other developments of the year were a new (Drumm) storage battery; non-magnetic cast iron for use in electrical equipment; higher elevator speeds; application of the theory of probabilities to power calculations for elevators; new electric ships.

Russian Projects.—The "five-year plan" of industrialization of the U.S.S.R., which went into effect October 1, 1928, is being pushed energetically as far as power resources and machinery manufacturing are concerned. Contract for five additional vertical waterwheel generators for the Dnieper river plant has been given two American firms which have already built four, rated 77,500 kv-a., the largest ever constructed. An American is in charge of the Dnieper river 750,000 h.p. project, and an American firm will supervise the construction of a new 120,000 h.p. plant.

AUTOMOTIVE ENGINEERING

By Austin M. Wolf

Automotive Consulting Engineer, New York

GENERAL

Two extremes of automobiles were introduced during 1930, the diminutive European type car and the large and luxurious models with twelve- and sixteen-cylinder engines. The rapid adoption of balloon tires is the outstanding development in the truck and bus fields. The development of a high boiling point cooling fluid forecasts the possible return of the liquid cooled type aviation engine, especially for greater power output. This year also marks the final development and production of the aviation Diesel.

ENGINES

Other than smooth running, lack of vibration, and great accelerating ability, the decrease of stress variation without increasing the stress of all the members in the power transmission line is an important virtue of the twelve- and sixteen-cylinder engines as compared with the eight. Many makers are again increasing the cylinder size for greater output. The increased power demand is also evident in the bus and truck fields. Various measures are being used to increase silent action.

Compression ratios are being held at a conservative value to assure maximum smoothness, with 5.6-1 as the top limit for ordinary fuels. A number of cars have a bore and stroke ratio approaching unity and one car has a bore 1/16-inch larger than the stroke.

A 45° angle is used between the axes of the two cylinder banks of two sixteen-cylinder car engines. This gives equal firing impulses. Some contend that unequal spacing of the impulses tends to reduce torsional vibration. One eight has always used 60° while a new twelve has 45° and a marine type twelve has 70°.

One of the sixteens has an aluminum alloy casting taking in all sixteen cylinders and the upper half of the crank case, the cylinder wall being an inserted case hardened steel liner, sealed at the top by the head gasket and at the bottom by two rubber rings. The two heads are also of aluminum alloy with aluminum bronze valve seats.

A new cast iron alloy with about 14 per cent nickel content has been developed, having a coefficient of expansion 50 per cent greater than ordinary gray iron. As a cylinder liner, it makes an ideal combination with an aluminum piston of high silicon content.

An automatic take-up, replacing the ordinary valve adjustment, appears on an overhead-valve engine in which the valve rocker is mounted on an eccentric whose position is regulated by an hydraulic dash-pot-pump unit. Valve spring surge is being combated by the use of springs of variable pitch, the coils being closer together at the ends and farther apart at the center. One maker has a damper in the form of a cap fitting over the top of the springs, two depending and opposite fingers contacting with the center coils. Valve guides of pearlitic iron alloyed with nickel and chromium have considerably higher hardness than ordinary soft iron. They are also made with graphite compressed into helical grooves, providing a self-lubricating unit. One maker has shortened the exhaust period and the inlet valve opens 10° of cam motion after the exhaust valve has closed. Idling conditions are improved, because with overlapping valves the high vacuum in the cylinder draws in exhaust gas and contaminates the incoming charge.

Pistons are cam-ground by one maker to an elliptic form to counteract the unequal expansion of some aluminum alloy designs, permitting reduction in the clearance allowance without danger of seizure. To counteract oil-pumping in view of increased driving speeds, a new ring is being made with a comparatively wide groove in the center so that it bears only on the narrow widths on both sides. Ovalling of the face is impossible and a firm and constant edge contact with the cylinder wall is maintained.

Light steel connecting rods are being used with aluminum caps to dissipate heat as well as to save weight. The steel upper half controls the expansion in the same way that a steel cap controls the upper half of an aluminum rod.

Polishing the exterior of the aluminum crankcase is a luxury found in some high-priced cars. Scientific application of ribbing and the thickening of the roof of the case increased the rigidity of one block-case unit 43 per cent, at an expense of 1½ per cent added weight. Rather than to suck the crankcase fumes into the carburetor, some makers have changed to the ventilation method in which the fumes are conducted out below the pan. Crankshaft rigidity is still being sought, such as by adding more metal to the cheeks. An increasingly popular vibration damper consists of a rubber plate bonded to two discs, one being attached to the crankshaft hub and the other to the fan pulley-flywheel.

Cooling of the lubricating oil is essential in view of sustained high-speed driving. An oil-water intercooler is used by one maker, located at the water inlet to the cylinder jacket from the pump. Another maker partitions off two inches of the radiator core and circulates oil through it by means of a separate pump. Increased cooling effect from the pan is obtained by making the returning oil flow by means of vertical partitions toward the ends and then back to the center before it can be picked up by the oil pump. Helical pump gears of small angle are commonly used for quietness and for increasing the capacity of the pump. A new location and drive for the pump is at the forward end of the engine, driven by a roller chain from the forward end of the crankshaft. Pressure lubrication of the tappets is new, the tappets being of the finger type.

Changes in fan blade shape and pitch, with decreased diameter, number of blades, or reduced fan speed have been made to reduce fan noise. Plastic pump packing material inserted in a tapped hole and forced into place by a cap screw, is a new development. Several makers have the thermostat mounted on the water outlet riser on the cylinder head operating the radiator shutters. Water circulation has been speeded up for greater heat dissipation.

A fifth mounting point of the unit power plant consists of a trunnion at the rear of the transmission, supported by rubber bushings. One manufacturer has a pressed steel cross member surrounding the clutch housing which also supports the bell housing through four rubber mountings spaced around the opening. Vibration about the neutral inclined axis is permitted in one *V* eight-cylinder unit power plant by means of two rubber supports below the transmission, a diagonally mounted laminated spring at each side of the engine at the front, and a synchronizer to prevent excessive rocking.

Downdraft carburetion is increasing. A prominent development of the year is the intake silencer to reduce the "power roar." Preventive methods against vapor lock consist in running the fuel line forward from the tank on the outside of the frame to protect it from the heat of the exhaust pipe and muffler, or on the opposite side therefrom to the front of the engine, across and back to the fuel pump. The pump is also shrouded to protect it from heat.

Asbestos insulation is used to cover the exhaust pipe from the manifold to a point under the engine pan not only as a heat protection but to deaden the metallic ping. The exhaust manifold with central outlet is increasing. A new muffler consists of a straight tube with perforations, the space between it and a surrounding steel pipe being filled with steel wool.

Removing the ignition coil to the top of the cylinder block places it out of the way of the possible spray through the radiator. A recessed mounting in the radiator top tank does likewise, also cleans up the engine compartment and provides a more nearly constant coil temperature. A solid copper gasket in place of the asbestos-filled copper type, increases the heat flow from the shell and therefore the shell electrode. A new electrode alloy has been developed to reduce the voltage requirements.

CLUTCH

Interchangeable clutches of different diameters have been made possible by the use of a perfectly flat flywheel face. Reduced spinning of the driven member has been accomplished in one car by utilizing an aluminum alloy plate, 1/16-inch thick. For this reduction, which is essential to the successful operation of the transmission synchronizing clutches, one maker has discarded the multiple disc in favor of the single plate clutch. The outer ends of the spokes of the driven member of one clutch are embedded in molded friction material and release of the pressure plate is accomplished by positive leverage instead of the springing of the driven plate. New cushioned drives consist of a hub with six spokes surrounded by a uniform thickness of rubber within a die-casting riveted to the driven plate and a spring drive consisting of eight coil springs nested in rectangular openings in the central driven plate and the adjacent hub plates.

TRANSMISSION

Free wheeling is the outstanding transmission development of the year. Three cars are using the type in which an overrunning roller clutch is interposed between "high" and the speed below. Another maker uses a clutch at the rear of the transmission consisting of a single coil spring of rectangular section, ground on the outside and closely fitting within a cylindrical member. Rotation in one direction tends to unwind and causes the spring to grip. The synchromesh design has been adapted to lower-priced cars by eliminating the oil dash-pot timing control and substituting a spring-yielding member on the cone clutches or in counting on the time required to squeeze out the oil film between the two clutch parts. There is a decided trend toward the use of helical teeth for the constant-mesh and below-high gears, the latter being continually meshed. The clutch member for engaging direct or below-high consists of an internally splined ring.

UNIVERSAL JOINT

The spherical cap type of joint has been improved for better sealing by the addition of a light pressed steel ring between the yoke and the spherical cap, being centered on the former. A constant velocity joint has been developed, consisting of a spherical segment and shell in concentric relation, six balls being distributed in grooves ground in each member.

REAR AXLE

A sixty-inch tread is used on several cars while one maker in claiming the widest rear seat is using sixty-one-inch. Finer pitch is being used on some pinions and ring gears for increased quietness. The gearing and axle shafts have been increased in size to cope with the additional power of the engines. Due to high-tooth pressures, lead-base lubricants were resorted to a year ago but the excessive wear on the bearings has encouraged lower tooth pressures incident to larger gearing and the use of regular petroleum lubricants. A process has been developed to make axle housing from steel tubing, cutting and upsetting the center. One axle maker can furnish double reduction driving units that are interchangeable with his worm units. Redesigning of truck and bus axles has been necessary to accommodate balloon tires. The reduced spring center distance calls for narrower frame widths.

BRAKES

Brake diameters are continually increasing while rim diameters are decreasing, a condition confronting the truck and bus industries a few years ago with a conflict between the two conditions. A repetition is coming in the passenger car field. Cable controls are being rapidly adopted to eliminate rattle and binding due to insufficient lubrication. One maker is providing equal distribution of braking effort between front and rear wheels. A new drum consists of a cast iron ring, *T* section in shape, centrally supported by a stamped steel spider. Distortion and bellmouthing of the ordinary drum is overcome. Tubular brake cross shafts of large diameter are being used for their torsional stiffness.

FRONT AXLE

The front axle *I*-beams have been increased in stiffness in several instances. A tubular member has been developed, the ends being formed and welded around a spool taking the knuckle pin. Spring-seat pads are mounted over a flattened portion and against the tapered sides. Underslung front springs are used by a second manufacturer, permitting a straighter axle design and reducing the torsional strain of braking. Balloon tires for commercial use have necessitated wider axles while still accommodating relatively small spring centers so as to give clearance at maximum turning angles. One maker retains vertical king pins as a means practically to eliminate shimmy trouble and to give easy steering.

WHEELS, RIMS, TIRES

Dual wheels are to be found on even the smallest trucks. The 13.50-inch tire on 20- or 24-inch rims has been developed for heavy commercial use. Large hub caps and small wheels make cars look lower. Hub caps have been growing in diameter each year. A number of passenger cars are now using 17-inch rims, with either 6.00-, 6.50- or 7.50-inch tires. A 16-inch rim is being experimented with. The welded metal spoke wheel has been adopted by one of the high-priced cars.

SUSPENSION

The wide tread rear axles permit large spring centers, resulting in stability and elimination of side sway. Various types of anti-kick shackles are being used to ease road shock. One maker has replaced the former rubber with metallic shackles, except at the fixed end of the left front spring. Metal spring covers are increasing. The full-elliptic spring used by one manufacturer has been improved by the elimination of the former welded-on eyes.

FRAME

Torsional frame rigidity has been accomplished by sturdier cross-member design, one of which utilizes a member inside of and curving with the rear kick-up, with large cut-outs for lightness, and verticle flanges at each side of the kick-up. It is claimed that this strengthening of the rear end of the frame materially reduces weaving at the front end. Another maker uses an *X* member with a spread of 75 inches and the propeller shaft passing therethrough. By his use of underslung front springs, the reduction in the size of the section of the side rail over the axle is less than in the conventional axle. Cross-members have been located close to the shock-absorber mounting in the side rail.

CONTROL

For improved sensitiveness in normal driving, an accelerator pedal linkage has been designed so that the pedal will have a greater travel for the 25-30-mile-an-hour range. Foot pedal pressure for the brake is reduced by the use of a vacuum operated booster, now used by several passenger cars as standard equipment. A ball-bearing ball joint has been developed for drag link and tie rod use, reducing considerably the physical exertion for operation. Another ball joint has an automatic take-up for wear by the use of two ball cup halves located in inclined slots and under the influence of a spring. One maker has relocated the emergency hand brake lever at the center from its former left position.

EQUIPMENT AND DESIGN

The single, wide-bar bumper is now the vogue. It is also used at the rear instead of bumperettes. Headlights with oval windows lend a new touch. There is also a rectangular window with well-rounded corners, the long axis being verticle. Hydraulic shock absorbers have captured the field. The axle mounting of one manufacturer has been discarded for the conventional frame location. An increased number of cars have the horn mounted below the left headlight. An automatic chassis lubricating system utilizes a diaphragm pump actuated by variations in the amount of vacuum in the intake manifold. Tire covers now consist of a chromium-plated band surrounding the tire and a side ring finished in the body color. Several cars use instruments of the aviation type.

Radiator grilles with chromium plating are very popular. The grille is sometimes built right into the shell. The *V* type radiator has come back strongly, the present beautiful designs bearing little resemblance to their hard, angular prototypes. Some slope forward at the bottom. Shutters or stationary vanes extend the full depth, eliminating the former false bottom as well as aprons. A deep, narrow effect is obtained which is further accentuated by the absence of horizontal lines, such as the lamp tie rod. The depth of the shell on two makes allows this rod to be carried across between the core and the shell, concealing it.

Greater use is being made of hood doors in place of louvres. Concealed hood catches are on the increase. Fenders are long and sweeping, with increased flange depth or as in one of the latest designs with a rounded turned-in-edge. Front fenders are appearing more and more like airfoils. The apron is sometimes brought in to the inside of the spring horn and extended down, replacing the former splash-apron.

Our air-mindedness is being reflected in the new body designs, with their sleek contours and absence of projections and gagets. Furthermore car speeds have now reached a pace where stream-lining and reduced air resistance must be carefully studied. Windshields are being given more rake, for this reason and to increase visibility. Stationary windshields are also used for better vision in eliminating the usual wide top header. Elimination of the outside sun vizor is taken care of by inside, adjustable flaps. The latest design incorporates a front metal roof panel curving back from the top of the windshield. The fuel tank is concealed by the body itself, the lower rear panel being of double curvature, sweeping backward at the bottom. Windshields of *V* shape are also appearing. Center pillars of *T* section steel are used by several manufacturers. Larger rear windows are used for improved visibility. Several coupes have crank-operated rear windows that can be opened for ventilation.

The lower contour of the bodies are dropped in a graceful line to give a "coach-sill" effect. The belt line is generally higher. Some models are provided not only with arm rests in the rear but also in the center of the front cross seat, being of the folding type, and on both front doors for riding comfort. Seats fitted with down pillows over Marshall springs are in regular production on one model. Doors, body panels, floor boards, rear seat pan and the inside of the cowl are covered with sprayed-on, heavy coating of a semi-plastic compound which acts as a sound deadener and heat insulator. Running board edges conform to the contour of the fenders, are often chromium-plated and are covered with rubber or linoleum with trimmings and inserts to give striking effects.

NAVAL ARCHITECTURE AND MARINE ENGINEERING

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BEARING OF LONDON NAVAL TREATY

The London Treaty of 1930, restricting naval armaments of the signatory powers, exerted a direct bearing and influence on naval architecture and engineering. In the first instance it operated to delay design and construction pending its outcome; second, to fix the size or displacement of the individual ships in various categories; and third, to limit the construction permissible. The second is the important consideration here in that it pointed out the problems and objectives of the designer. The provisions of the Treaty are recorded elsewhere. The general effect, from a technical point of view, may be stated to be: a general status quo with respect to heavily armored ships (battleships); a continuing restriction on aircraft carriers; a new restriction in light cruisers, destroyers and submarines. In the last mentioned is extended and magnified the importance of refinements in design and construction. Time was when space and weight were relatively unimportant. To meet given characteristics large factors of safety could be used, the demand on metallurgists to perfect materials and to evolve new materials of construction was not so insistent, installations and equipment of desirable but not vitally necessary character could be added, and the final result was achieved with possibly cost its only serious limitation. Today this picture is changed, fundamentally. In every component part of the hull, machinery and fittings of a naval vessel, materials represent the most efficient of a rapidly advancing art, every member is designed to be stressed to its maximum safe limit and every non-essential is omitted. The object is the maximum armor, armament, speed and reliability per ton of displacement.

NAVAL CONSTRUCTION

The new construction undertaken during the year included only ships authorized by the Act of Congress dated Feb. 13, 1929, which provided fifteen 10,000-ton cruisers, one aircraft carrier and three submarines. This program was curtailed to twelve cruisers by the London Treaty. The last two of these cruisers were laid down this year. Work on four previously assigned cruisers was completed during the year and these ships have been placed in commission. These cruisers are of 10,000 tons displacement, carry nine 8-inch guns, and have a speed of 32.5 knots. This construction will bring the U.S. Fleet of 10,000-ton, 8-inch gun cruisers up to fifteen ships. The contract was awarded also for an aircraft carrier of 13,800 tons. Three aircraft carriers are already in commission, one of the old *Langley* converted and the other two the more recent *Lexington* and *Saratoga*. One submarine of 1,500 tons displacement was placed under construction and two submarines of the largest type, the *V-5* and *6*, were commissioned. In addition to this new construction two battleships, the *Pennsylvania* and *Arizona*, completed modernization in which extensive protection against air and torpedo attack was provided and main propulsion machinery renewed.

MERCHANT CONSTRUCTION UNDER JONES-WHITE BILL

The stimulation to merchant-ship construction offered by the Government loan provisions of the Jones-White bill (Merchant Marine Act of 1928) has been marked. Up to Nov. 30 nineteen ships have been laid down this year (1930) in new vessels or in conversion jobs. These vessels are steam propelled except for five which are motor tankers. This year's construction under the Merchant Marine Act brings the total number of ships, built and building, to seventy. Of these fifty-two are new ships and eighteen are conversions. Fifty-three are steam ships, twelve are motor tankers and one is a motor passenger and cargo ship. The speeds of these ships range from 10 to 15 knots for the tankers, and from 15 to 20 knots for the passenger and cargo carriers.

ENGINEERING DEVELOPMENTS

Naval Design and Speed.—As indicated previously the London Treaty imposed a high premium on the weights entering into construction and equipment of naval vessels and on the economy of operation. Light, high speed ships are the result. In every item of cruiser machinery, and to a marked extent in carrier and submarine machinery, more and more power out of the same weight of material is being obtained. Some of the more prominent examples may be mentioned. Condensers underneath turbines have been adopted, making much more compact and lighter units. Condenser circulating water injection and overboard scoops have been redesigned, shortened and made more efficient. The materials and cutting of double helical gears for turbine speed reduction have been improved. A new type of boiler with higher evaporative efficiency has been developed. The welding of boiler drums instead of riveting has been applied to an increasing extent. The superheat of boiler steam has been increased, resulting in an overall gain in efficiency of the propulsive and auxiliary plants. New types of forced draft blowers and turbo generators have been developed which show a saving of approximately 50 per cent in weight and a gain of about that amount in economy. An increasing number of auxiliaries are being driven by electric motors in place of steam turbines at marked gains in economy. Further application has been made of aluminum for saving weight in electrical equipment and in other uses. It might be expected that some sacrifice in maintenance costs would be reflected in these changes, but so far this is not apparent and it is confidently expected that the gains in power per unit weight and in economy will be accompanied by reduced costs of maintenance in time and money by virtue of the greater simplicity achieved.

Merchant Vessel Economy.—In merchant construction the primary aim has been for increased economy, and vessels with fuel consumption of .60 pounds per horse power for all purposes are not infrequent. This gain in economy has been obtained by increased steam pressures and temperatures, boiler air heaters and economizers, stage feed heating, motor-driven auxiliaries and a general close attention to details which were once disregarded so far as economy is concerned.

CONSTRUCTION DEVELOPMENTS

Hull Welding.—The developments in naval vessels in hull construction and hull auxiliaries within the past year have been particularly along the lines already indicated as following the restrictions of the Washington and London Naval Treaties; that is, of saving weight in non-military features, in order that the weight so saved might be applied to features of a purely military nature, such as armament, protection or speed. Foremost in the means taken to save weight in hull construction is the use of welding. While welding has not been so far used in the construction of the main parts of naval vessels upon which principal structural strength depends, the use of welding has been extended to the construction of all light decks and bulkheads, the attachment of main bulkhead stiffeners, and to the building up of all piping systems and fittings generally. The savings in weight by the use of welding, with the elimination of structural shapes and rivets for attachment, have been very great, and the experience now being gained is undoubtedly leading to a time when completely welded construction, as is even now being used in some smaller vessels, will be employed.

Use of Aluminum Alloys.—Next in importance to the increased employment of welding in the construction of naval vessels during the past year has been development of the use of aluminum alloys. The use of such materials has been made possible by the development of alloys which are both strong and very resistent to the corrosive action of salt air. The use of these materials in rolled form has been extended to minor divisional bulkheads and furniture throughout, while the cast alloys are used extensively as substitutes for steel or composition castings, such as airport frames, ladder treads and bedplates for auxiliary machinery. Naturally the use of such light alloys has involved greater cost than that of the materials they replaced, but the consequent weight savings have been considered of enough value, in vessels of limited displacement, to justify the added cost.

Auxiliaries.—The developments in ship auxiliaries, such as steering engines, anchor engines, etc., have been toward a greater use of hydraulic-electric machinery.

Merchant Ship Welding.—In the construction of merchant vessels, as in naval vessels, the use of welding as a substitute for riveting in the connection of the parts of the vessel's structure is becoming more usual. Some small vessels have been constructed entirely by welding, but in the larger ships, the use of welding has been confined generally to connection of the less important structures and in the attachment of fittings.

SAFETY OF LIFE AT SEA

Pending Regulations.—In the spring and early summer of 1929, there was held in London a Conference on the subject of Safety of Life at Sea. This conference formulated regulations for seagoing merchant vessels, designed to carry passengers, fixing the maximum permissible spacing of bulkheads and lengths of compartments which would be permitted in order to ensure reasonable safety of the vessels and their passengers and cargoes in the event of damage in service. The regulations so determined upon by the conference have not yet been ratified by all the signatory nations, but as this action will undoubtedly occur in the near future, the effects have been felt during the past year in the designs of new merchant ships.

Effect On Merchant Ship Design.—In general the regulations affecting the design of merchant ships are considerably more stringent in their requirements as to numbers of bulkheads, in compartmentation, watertight subdivision and safety devices generally than have been considered necessary in the past and the result has been to introduce problems in the design of merchant ships which had not been experienced before; but, more than that, the ships so designed and now being built, will be safer than merchant ships of past years.

LOAD LINE LEGISLATION

March 2, 1929, there was approved an Act of Congress requiring the Secretary of Commerce to establish the necessary regulations to determine the maximum allowable drafts of vessels, due consideration being given to the different types and character of such vessels and the trades in which they might be engaged. The terms of the Act provided that these regulations should go into effect Sept. 2, 1930, so that the new rules have been operative but a few months. Up to the time of the passage of the above Act the drafts of American vessels had been limited only at the discretion of the master, by the exigencies of the trade, or in some cases by insistence of insurance underwriters on the observance of load lines fixed by Marine Classification Societies. The new law makes American merchant vessels subject to the same general restrictions as the merchant vessels of the principal foreign maritime powers which have had such laws in effect for many years, and is one of the necessary steps in connection with the growing importance of the American Merchant Marine.

During the Summer of 1930 there was held in London an International Conference on Load Lines. As a result of this conference, certain changes were made in the Existing Board of Trade regulations to suit modern vessels in special trades and the required free-boards of such vessels as tankers and lumber carriers were decreased, due to greater inherent safety of vessels in those trades. The agreement reached at this conference now forms the basis of the present policy of the Department of Commerce.

COMMERCIAL MARINE ENGINEERING

BY A. H. JANSSON

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SPECIAL SERVICE UNITS

The Sand Sucker, *Sensibar*.—In addition to the larger shipbuilding program the expansion of industry and domestic commerce calls for an increasing number of units for special service. During 1930 one of the most elaborate of these was the *J. R. Sensibar*, the largest sand sucker in the world, also one of the largest bulk self-unloading vessels. As far as records show this vessel is the fastest bulk cargo handling plant either afloat or ashore. No less than 4,500 tons of cargo can be unloaded either dry or wet per hour. Though the hull is not new, this vessel, complete and fully equipped, cost nearly $2,000,000. About a year was required to carry out the work. Her propulsion drive is turbine electric. Pulverized coal is used for fuel in three Scotch boilers furnishing steam at 180 pounds per square inch, superheated to 150 degrees Fahr. A part of her elaborate equipment consists of two 30-inch centrifugal pumps each driven by two motors in tandem with a combined horsepower of 1,500. This vessel is able to pump a mixture of sand and water to make a sand fill at a point four miles distant from her side. In addition there is a conveyor system installed with a conveyor belt boom on deck capable of delivering dry bulk material to a point 140 feet from the side of the vessel and to a maximum height of 80 feet.

Engineering Features.—In this vessel many modern features in marine engineering have been tried out. To minimize resistance to propulsion and to improve her steering qualities a streamline rudder of the Oertz type is fitted. Rubber stern bearings are not new. They have been successfully used for a number of years. This vessel, however, has the largest rubber stern bearings so far fitted, the tailshaft being 15 inches in diameter. There are numerous other engineering features, such as an elaborate centralized valve control system; a special signal system between the bridge and the engine room in connection with the operation of the vessel from the bridge under remote control. Practically all auxiliaries are electrically driven.

SHIP DESIGN AND ENGINEERING TESTS

Bulbous Bows.—In his annual address before the Society of Naval Architects and Marine Engineers, Homer L. Ferguson pointed out that the principal developments in naval architecture had been in the line of theoretical design and the application to practical uses of the theories developed in model tanks. The shipping board research program conducted tests with different sizes of bulbous bows on models with lesser block coefficients than previously tried. It was found that speeds up to .5 or .6 of the square root of the length of the vessel the bulbous bow was of little or no value. At higher speeds it was found, however, that the use of a moderate bulbous bow indicated a gain of a half a knot for 1,000-foot vessel at about 30 knots or for a 400-foot vessel at about 20 knots.

Speed Resistance.—Mr. Ferguson pointed out that European model tanks are making extensive studies of ships' forms for low resistance. These studies include proper forms of appendages particularly rudders for minimum resistance and the shape and characteristics of propellers to increase efficiency of propulsion. A new model tank at Rome as the year ended was about ready to begin work. Two new tanks are projected for Japan, one for Holland, one for Spain, and one for Russia. This indicates a general awakening to the value of model tank work. It is necessary for American naval architects and marine engineers to keep abreast of foreign developments if the ships of our new merchant marine are to successfully compete.

The Diesel Drive.—Touching on developments in marine engineering, Mr. Ferguson, who is retiring after three years as president of the Society of Naval Architects and Marine Engineers, points out that, while there have been few new developments in the past year, there are more ships being built with high steam pressures and high superheat with correspondingly low fuel consumption. An outstanding instance is the Hamburg American freighter *Uckermark*, where one boiler with a working pressure of 3,200 pounds does the work of the original four boilers. This means an obviously important saving in weight and space. The Diesel drive continues to meet with favor especially in Europe where Diesel engines are being rapidly improved, lightened and made smaller for a given power. Also geared Diesel drives, which, due to increase in engine speed, produce the power on less weight and size, are being successfully installed abroad. Welded steel housings make possible a considerable saving in weight in Diesel engines.

Electric drive is being used extensively for passenger vessels in the United States. Two fine vessels of this type, the *Morro Castle* and *Oriente* for the service of the Ward line between New York and Havana, have been completed by the Newport News Shipbuilding & Dry Dock Co. On the other hand, in Europe electric drive equipment does not seem to have been developed to a point where it can compete generally with other equipment. The advantage in this branch of marine engineering for the present is distinctly with the United States. Electric-driven auxiliaries are also being more widely used in the United States, adding considerably to the over-all economy of operation.

MARINE ENGINEERING PROGRESS AND CONSTRUCTION

Express Mail Liners.—The latest advances in marine engineering in the United States may be said to be represented in three large shipbuilding programs. Three 26,000-ton express mail liners for the Oceanic Steamship Co., a subsidiary of the Matson Navigation Co. The keel of the first of these two vessels was laid May 17, 1930, at the Fore River yard of the Bethlehem Shipbuilding Corp. These vessels are to be 638 feet in length overall; 79 feet in beam, 44 feet 6 inches in depth to the D deck; with a draft of 28 feet. Sea speed, it is expected, will be 21 knots. Propulsion will be by twin screws driven by modern turbines and reduction gears. Each shaft will be driven by three turbines through a set of single reduction gears. The anticipated normal shaft horsepower is 22,000 with a maximum of 25,000-horsepower. Watertube boilers of fairly high pressure and superheat will furnish steam. The names of these vessels are the *Monterey* and *Mariposa.*

Passenger Liners.—Two ocean liners are under construction at the Newport News Shipbuilding & Dry Dock Co. for the round-the-world service of the Dollar line. The first of these two vessels named the *President Hoover*, christened by Mrs. Hoover, was launched Dec. 9, and will be completed in October, 1931. These vessels are large, elaborate ocean liners and will have an anticipated speed of 21 knots. The cost of each vessel will be about $7,000,-

000. The main propulsive power is twin screw turbine electric. The length overall is 653 feet; length on the water line, 630 feet; length between perpendiculars, 615 feet; beam molded, 81 feet; depth to shelter dock, 52 feet and design load draft, 32 feet. The gross registered tonnage is 23,000 and the displacement is 31,000 tons. Accommodations will be furnished for 1,260 passengers in all classes and a crew of 300 men. Steam will be supplied by 12 water-tube boilers burning fuel oil. Up to the present time the Dollar liners are the largest merchant ships laid down in an American shipyard with the exception of the two United States liners referred to below. No effort is being spared to include in these ships the most modern marine engineering. There is no reason to think that any ship building abroad in their class will be superior to them. In Camden, N. J., Dec. 6, 1930, at the yard of the New York Shipbuilding Co., the keel was laid for the largest merchant vessel ever built in the United States. The first of two ocean liners for the United States lines then began to take practical form. The keel of the second liner for the same company will be laid early in March, 1932. These ships are 705 feet in length, 86 feet in beam and of about 30,000 gross tons. The first will be delivered in July, 1932, and the second in November of that year. The speed is to be about 22 knots. They will carry first, tourist and third-class passengers to a total of about 1,300. The cost of the two ships is approximately $21,000,000. Loans aggregating $15,750,000 for the two ships have been allowed by the Shipping Board. At the time this is written nothing definite was known about the propelling machinery, except that it would be in twin screws driven either by geared turbines or turbine electric combination. The boilers are to be of the watertube type of reasonably high pressure and superheat.

Super-liners.—All during the past year plans have been under way for two super-liners for the United States lines for the North Atlantic, Continental European and Hamburg-Bordeaux range. Progress toward the consummation of contracts for these two super-liners has been held up pending an amendment to the Jones-White merchant marine act of 1928 providing for a greater proportionate mail compensation for speeds in excess of 22 knots. It has been clearly established that the allowance under the terms of the present act does not increase in fair proportion to the increased cost of obtaining higher speeds. To meet competition of the Cunard Line, for instance, which, it is understood, has definitely settled on the building of a 1,018-foot ship with a beam of 115 feet and a top speed of 32 knots, it will be necessary to greatly modify the original ideas of two 45,000-ton liners with a speed of 28 knots. That two American super-liners are to be built is made definite by the contract under which the United States Lines was purchased by private interests and also as a fixed governmental policy to build up an adequate merchant marine.

Passenger-cargo Ships. — The building program for the Export Steamship Corporation, which commenced late in 1929, progressed favorably during the past year. The first of the four ships contracted for with the New York Shipbuilding Company, the *Excalibur*, was launched Aug. 5 and had the honor of being christened by Mrs. Hoover. The second vessel, the *Exochorda*, was launched Oct. 18, christened by Frances Glover, daughter of the Second Assistant Postmaster General. The keel for the third ship, the *Exeter*, was laid Aug. 11 and the fourth, the *Excambion*, was laid down toward the end of October. These vessels are particularly high class combination passenger-cargo ships. Though provisions are made for accommodations of the highest type for 152 first-class passengers, cargo arrangements and space have not been sacrificed. The cargo capacity is approximately 6,000 tons. The over-all length is 475 feet, beam molded 61 feet 6 inches, depth molded to shelter deck, 42 feet 3 inches, and gross tonnage, 8,700. The hull is of the flush deck type with raking bow and overhanging stern. The propelling machinery, driving a single propeller, consists of Parsons type triple series, single reduction, steam turbines designed to develop 8,000-horsepower and to give a ship speed in excess of 16 knots. Steam at 350 pounds pressure and 200 degrees of superheat will be supplied by four oil fired, watertube boilers having a total heating surface of 16,000 square feet. All equipment will be of the latest type and mainly electric driven. For navigation purposes a gyro compass, gyro pilot, radio direction finder and a high-powered wireless set having a capacity of maintaining continuous communication from New York to Gibraltar. Life-saving equipment is of the latest to meet the requirements of the international safety convention. Fire protection will be provided by CO_2 system and the passenger quarters will be guarded by an automatic fire alarm system.

Turbine-electric Liners.—A new time record has been set between New York and Havana of less than 59 hours by the new turbine-electric liner *Morro Castle*, which was completed at Newport News Shipbuilding & Dry Dock Co., and sailed on her maiden voyage from New York to Havana, Aug. 23. She is the first of two turbine electric express liners, each costing $5,000,000. The second vessel, the *Oriente*, had successful sea trials Nov. 12 and sailed on her maiden voyage from New York to Havana in the latter part of December. Designed by Theo. E. Ferris, these two vessels combine modern advances in engineering with special fitness for their trade. The length over-all is 508 feet; length between perpendiculars, 482 feet; beam molded, 70 feet 9 inches; depth molded, 39 feet; gross tonnage, 11,520; passenger capacity, 438 first class and 95 tourist. They are of three deck, complete superstructure type with combined forecastle head and long bridge, forming flush deck forward. These vessels are equipped with twin screw electric propelling machinery consisting of two main turbine generators, two main propelling motors and three auxiliary turbine generators. Engine room auxiliaries are partially electric and partially steam driven. There are two main propulsion motors. The two marine type General Electric steam turbines have maximum continuous ratings of 8,000 propeller shaft horsepower at 3,168 revolutions per minute which corresponds to 144 propeller revolutions per minute. Steam conditions at the main turbine throttles are 275 pounds per square inch; 200 degrees Fahr. superheat. The turbines exhaust into condensers maintatining a 28¼-inch vacuum with 70 degrees Fahr. seawater. The two main propelling motors of synchronous induction type are each rated at 8,000 shaft horsepower maximum continuous output at 144 revolutions per minute, 3,150 volts, three-phase, unity power factor and torque margin in combination with generator characteristics 40 per cent. Obtaining a maximum speed of 22 knots in trial run on March 1 and 2, the turbine electric liner *Santa Clara* established herself as about the fastest steamship ever built in America for foreign trade. It is possible that the liners *Great Northern* and *Northern Pacific* at their peak of performance equaled this speed. The *Santa Clara* was the first passenger ship built under the Jones-White Merchant Marine Act of 1928 and therefore represents in definite form the Government's move toward a systematic rehabilitation of our merchant marine. The total cost was $3,500,000. She was built at the New York Shipbuilding Co. for the United States and South American service of the Grace Steamship Co. The *Santa Clara* is 505 feet ½ inch in length overall, 63 feet 9 inches in beam, 37 feet 3 inches from upper deck to keel and has a gross tonnage of 9,500. Fine accommodations are provided for 208 first-class passengers. Her cargo capacity is 6,900 tons. The turbine electric machinery consists of two 4,800-kilowatt, three-phase, 3,000-volt General Electric alternating current generators each driven by a steam turbine at 3,000 revolutions per minute. These generators supply electric current to two 6,300 horsepower electric motors each direct connected to a propeller. Steam is supplied by six oil fired Babcock & Wilcox watertube boilers with a working pressure of 300 pounds, superheated. The boilers are oil fired.

USE OF THE DIESEL ENGINE

The City of New York.—Outside of numerous tankers under construction during the past year, the only ocean-going vessel with Diesel drive is the *City of New York*, completed by the Sun Shipbuilding & Dry Dock Co., Jan. 18, for the American South African line. This vessel is principally a cargo ship. Her length overall is 470 feet 9 inches; length between perpendiculars, 450 feet; breadth molded, 61 feet 6 inches; depth molded, 37 feet; draft, 26 feet; gross tonnage, 8,272. Passenger capacity first class is 56 and cargo capacity in cubic feet, bales measurement, is 449,055. The fuel capacity is 2,200 tons and sea speed is 14 knots. The propelling machinery consists of two four-cylinder, Sun-Doxford opposed piston oil engines. Each engine is direct connected to a propeller. The brake horsepower of each engine is 2,700 at 100 revolutions per minute. This vessel has done well in service and arrived at Brooklyn, N. Y. on Aug. 27, with a new record for the direct run between the United States and South Africa. On this voyage she improved on her own record for the same distance by 12 hours. She sailed from Cape Town Aug. 5 and although she stopped at Trinidad, completed her journey to New York in 21 days and 12 hours.

Application of Diesel Power.—Though the Diesel engine has not found wide application in larger ships during the past year, it is somewhat accounted for by the absence of the cargo ship from the program of building. In lesser ships the Diesel and Diesel electric drive seems to be steadily increasing in favor. Taking all vessels, large and small together, the United States is far behind the rest of the world in the application of this type of power to ship propulsion. In Great Britain and Ireland, for instance, 57 per cent of all new construction is in motor vessels. In all other countries grouped together it is 63 per cent. In the United States only 20 per cent is in this type of drive. Careful analysis, however, of all steel merchant type of vessels 100 gross tons and over, including coastguard ships, lightships, Government river boats, etc., under construction in 1929 in the United States, published in the April issue of *Marine Review* gives a somewhat different aspect to the position of the Diesel engine in ship propulsion. This analysis showed (and relatively it will be similar for the year 1930) that of 145 vessels listed, 80 or 55.2 per cent in number were fitted with Diesel power. In gross tonnage these motor vessels represented 29.3 per cent and in horsepower, 18.5 per cent. The average horsepower per unit was only 878. These figures do not include many ocean-going yachts with Diesel drive in horsepowers up to 3,000.

Electric Drive.—The two large electrical companies, General Electric and Westinghouse, developed electric drive for ship propulsion in naval work. It has now grown to wide acceptance for the better class fast passenger and cargo vessels under way or contracted for in American shipyards. Each company is furnishing turbine electric propelling equipment for one ship for the Dollar line, of approximately 26,500 horsepower. Six vessels of 11,000 horsepower each for the United Mail Steamship Co. are to be fitted with General Electric turbine electric drive. There has also been an increasing demand for Diesel electric propulsion where smaller vessels are concerned. Among these are lightships, special vessels for the engineer corps, small tankers, river boats and harbor and ocean-going tugs. Four tugs of this type with 1,000 horsepower in two Diesel engines and an 800 horsepower electric motor direct connected to the propeller were completed toward the end of the year for the Erie Railroad. These tugs have been dubbed "locomotives of the sea" on account of their great power and easy control. Pilot house control is one of the important features of Diesel electric drive. In fact there is one instance of a Diesel electric tug completed for towing a carfloat of 16-car capacity where the towboat can be controlled from the bridge of the carfloat by means of remote control through cable connection.

CONCLUSION

A review of the progress of marine engineering in the United States during the past year clearly shows that in the combination of engineering talent developed by the great industrial companies, the shipyards, the steamship companies and private practice, this country is not only keeping step with progress the world over but in some particulars blazing the way of advance.

MATERIALS OF ENGINEERING AND CONSTRUCTION

By C. Laurence Warwick

Secretary-Treasurer, American Society for Testing Materials

METALS

The Metallurgy of Steel Making.—Research in the physical chemistry of steel-making, as carried out at the Pittsburgh Experiment Station of the U. S. Bureau of Mines (see The American Year Book, 1928, p. 630) in coöperation with Carnegie Institute of Technology and the Metallurgical Advisory Board, has covered a series of fundamental studies of the action of oxygen in liquid steel and the application of the findings to open-hearth operation (*Metals and Alloys*, December, 1930, p. 883). The solubility of *FeO* in steel has been determined over a wide range of temperature and the data have been used extensively in determining the saturation of a bath of open-hearth steel under any conditions of slag composition. Deoxidation with silicon, aluminum, manganese, manganese-aluminum alloys, aluminum-silicon alloys, and manganese-silicon alloys has been studied. Special attention is being given to the application to plant work of the principles that have been developed. The eyes of domestic and foreign steel makers are focused on this work, which is an outstanding example of coöperative research.

Manganese Steel.—A summary of the status of medium-manganese steels by E. E. Thum (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 215, 1930) points out the value of manganese for high-strength structural steel, for steel rails and for ship and boiler plate. Contrary to the belief that manganese should be held below 1 per cent in order to avoid brittleness, the alloy is strong and tough if carbon is reduced proportionately as the manganese is increased. Structural material with 0.20 to 0.45 per cent carbon and 0.80 to 1.80 per cent manganese gives strengths of 80,000 to 100,000 lb. per sq. in. and yield points of 45,000 to 55,000 lb. per sq. in. Rails with 0.55 to 0.70 per cent carbon and 1.20 to 1.60 per cent manganese are being used in increasing amounts. As the result of a laboratory study on a series of chromium-manganese steels, A. B. Kinzel, and D. G. Miller (Am. Soc. Steel Treating, *Transactions*, July, 1930, p. 55) point out that the addition of small percentages of chromium to manganese steel increases the ultimate strength without proportionate decrease in ductility and also gives greater ductility for the same ultimate strength and the same carbon content.

Eighteen and Eight.—A major topic of metallurgical discussion for the past several decades has been the woeful waste produced by corrosion of the ordinary carbon and alloy steels. Developments of the "stainless" type of iron alloys are numerous and there is now a voluminous literature on the subject; but the more such steels are used the more details crop up to be clarified. The many useful properties and comparative merits of the austenitic steels indicate that there is much more to be known and understood about this type of alloy. At the present time the chromium-containing austenitic steels hold the center of the stage and much attention is being focussed upon the austenitic alloy containing 18 per cent chromium and 8 per cent nickel. The corrosion resistance of this alloy leaves little to be desired. Its modulus of elasticity is a bit low but its impact resistance is extremely high, and it has a high coefficient of expansion. Its strength in its most corrosion-resistant condition, quenched from about 2000 deg. F., is not very high but it has great ductility, is extremely tough, and will stand much deformation in cold working. N. B. Pilling (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 278, 1930) points out that this alloy is not in an entirely stable austenitic condition and that on cold-working it hardens rapidly, its magnetic permeability increases and alpha iron is precipitated. It has respectable strength at high temperatures but tends to become brittle under some conditions of high-temperature service. He advocates the use of 14 per cent nickel instead of 8 per cent, claiming that this composition puts the alloy in the stable austenitic range. F. M. Becket, however, is working in another direction (Am. Iron and Steel Inst., Preprint for May, 1930 Meeting), replacing the nickel by manganese. It is well known that manganese is even more potent than nickel in producing austenite and the study of such a substitution is quite logical. The chromium-manganese alloy, while not as corrosion-resistant under all conditions as the chromium-nickel alloy, is resistant to sulphur attack to which nickel is prone; it welds and works well, and is said to be free from high-temperature embrittlement. The future will unquestionably witness much greater application and use of stainless steels whether of the chromium-nickel or chromium-manganese type, or some other type yet to be developed.

Cold-Drawn Bridge Wire.—After the failure of the heat-treated galvanized alloy-steel wire in the Mount Hope and Detroit suspension bridges (see THE AMERICAN YEAR BOOK, 1929, p. 626) it was decided to replace the cables and use cold-drawn steel wire. Tests covering all practical questions in connection with the strength and behavior of the wire during storing, erection and thereafter as part of the bridge structure under dead and live loads and climatic conditions is described by L. S. Moisseiff (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 313, 1930). The wire, with an upper carbon limit of 0.85 per cent, had a minmimum tensile strength of 215,000 lb. per sq. in. yield point of 144,000 lb. per sq. in. and an elongation in 4 in. of 4 per cent. Creep or fatigue tests under loads up to one-half times the design stress and of a duration of two months, as well as freezing tests, were carried out. The results were very satisfactory and furnish assurance to bridge builders on the reliability of cold-drawn wire for bridge structures.

New Process Wrought Iron.—The need for more economical methods in the manufacture of wrought iron has long been recognized. A new process which differs radically in a good many respects from the present method of puddling has been invented by Dr. James Aston (Bureau of Standards, *Research Paper No. 124*, vol. 3, December, 1929), in which the essential objects accomplished in the puddling process as ordinarily understood are attained in a unique manner. The melting of the raw material (pig iron) is done in a cupola, the refining of the molten metal in a Bessemer converter, the production of the slag of proper composition in an open-hearth furnace by itself, and the mechanical disintegration of the iron and the incorporation of the slag with it are attained by pouring a charge of the molten refined iron "shotting" into a bath of the molten slag. The squeezing of the "ball" of iron into convenient form for working and the mechanical working of the squeezed iron are the same in principle as the methods ordinarily employed with the hand-puddled product. Comparison tests at the Bureau of Standards indicate no marked differences in the mechanical properties in the two irons in pipe form as shown by tension, torsion, and flattening tests. Accelerated laboratory corrosion tests indicated very slight differences in the corrosion resistance in favor of the hand-puddled iron.

Die Casting Alloys.—Die casting metals and alloys have been greatly improved in the last few years (see THE AMERICAN YEAR BOOK, 1928, p. 631), and considerable reliable information on the properties of such alloys used in cast parts has been made available. The investigations of the American Society for Testing Materials (*Proceedings*, vol. 29, I, p. 192, 1929; vol. 30, I, p. 318, 1930) on twelve aluminum-base and nine zinc-base alloy compositions involving determinations of the tensile strength, ductility, hardness and impact tests on these alloys and certain accelerated corrosion tests, such as exposure in water-vapor atmospheres at elevated temperatures and immersion in heated paraffin, have yielded information which is having important effect on comercial production of die-castings. The disintegration of certain types of zinc-base die-casting alloys due to intercrystalline oxidation, has been a major deterrent to their wider use. The susceptibility of the alloys to disintegration is affected by the conditions under which the structural change occurs. Growth and oxidation of zinc-base die castings in the presence of water vapor has been shown to be accelerated by the presence of tin and lead as impurities and to be reduced by the addition of small quantities of magnesium. It has been clearly established that the use of zinc of the highest purity commercially obtainable (0.02-per cent maximum impurities) is essential where the maximum longevity is expected in the presence of moisture. Zinc-base die castings containing aluminum can now be used as an engineering material, as their physical properties and permanence have been enormously improved. The rapid growth of die-casting practice is due almost entirely to the automotive industry, which today consumes over 50 per cent of all die-castings produced.

New Silicon-Zinc-Copper Alloy.—The preparation of silicon-zinc-copper alloys containing 70 to 90 per cent of copper and up to 5 per cent of silicon is described by E. Vaders (*The Metal Industry*, London, Oct. 3, 1930). Silicon-zinc-copper alloys have a homogeneous solid solution structure up to a much higher silicon content in the copper corner of the ternary diagram than has hitherto been assumed—for example, 4 per cent silicon can be retained in solid solution. These alloys can be worked hot as well as cold, and some of them have outstanding properties as bearing and bell metals.

AUTOMOTIVE AND AIRCRAFT MATERIALS

Automobile Materials.—New uses for raw materials and greater economy in present methods of automobile manufacture are discussed in a Symposium on Developments in Automotive Materials (Am. Soc. Testing Mats., March, 1930). Plain and alloy cast iron, sheet steel, rustless steel, die castings, bearing metals and aluminum alloys are among the outstanding developments in the metal field. Alloy cast irons for cylinders have the lowest coefficient of expansion and both nickel and molybdenum irons were suggested. The most important metals for preserving iron and steel are, in order, chromium, nickel and silicon, and frequent surface rubbing is essential to maintain corrosion resistance. The developments in heat-treated alloys for both cast and wrought products, the more common use of strong aluminum forgings, the rolling of light-weight alloys into structural shapes and the advent of magnesium as an engineering material, provide an outlook for the future more promising for use of light metals than at any time in the history of the automotive industry.

The papers on non-metals included an excellent recapitulation of tests for motor fuels, difficulties encountered in cylinder oils, evolution in automobile finishes, development of phenol resinoids for plastic molded products and a discussion of some sixty-five uses for rubber compounds in automobile construction. New color finishing processes have aided in practically doubling automobile production in less than ten years, and the almost universal use of closed car bodies would have been practically impossible without lacquers. It is interesting to note the influence of transportation in the development of materials engineering. From the earliest days the problem of utilization of materials by railroads has been important and the development of improved materials to meet increasingly severe requirements of operation is reflected in the many new and revised specifications. The modern automobile has, similarly, been made possible by improved and new materials and processes, and now the latest means of transportation—aircraft—has claimed the attention of materials engineers.

Aircraft Materials.—A frank discussion of the many materials problems confronting the aircraft industry was presented in a Symposium on Aircraft Materials (Am. Soc. Testing Mats., *Proceedings,* vol. 30, II, pp. 26-214, 1930). There is perhaps no industry in which an exact knowledge of the properties of materials is more necessary. Each individual part must be completely dependable and yet must be reduced to the lowest weight. Factors of safety must be ample, but factors of ignorance negligible, and it is necessary to know just what service each type and class of material will render. That this calls for accurate and complete engineering data, adequate and standardized specifications and rigorous and thorough testing to insure that requirements are met, was made clear by the many papers on all types of materials entering into aircraft constructions. The papers, intentionally brief, presented a splendid resumé of data and tests on ferrous metals, high-alloyed steels, structural and engineering light alloys and strength and characteristics of wood used in aircraft construction; also corrosion prevention methods, aeronautical textiles and notes on aircraft finishes such as dopes, pigments and paint finishes. Two papers dealing with aircraft engines, one with the materials entering into the construction of engines and the other with the failure of such units, brought out valuable facts concerning the metals most commonly used in engine parts which cover practically the entire field of structural alloys. The subject of welding, covered by two papers, one on metal joints, the other on procedure control in aircraft welding, pointed out that chrome-molybdenum steel is replacing straight carbon and chrome-vanadium steel because of its easy weldability. Welding of nickel steel is not successful and gas welding is satisfactory for aluminum and its alloys, using small welding torches. *x-ray* testing and photo-elastic studies of aircraft parts were also described. An excellent paper on the heat treatment of aircraft parts covered briefly the purpose of and equipment for heat treatment and the effects thereof upon the mechanical properties of metals, including metallurgical factors requiring technical direction and supervision. On the whole the symposium gave the impression that while great improvements in aircraft materials have been made, there is a vast amount of work in this direction yet to be accomplished.

NON-METALS

Cement.—Comprehensive studies of the constitution of portland cement clinker by the Portland Cement Association Fellowship at the U. S. Bureau of Standards indicate that the *X*-ray diffraction apparatus (Bureau of Standards, *Journal of Research,* No. 5, 1930, p. 813) is an indispensable tool with which to study the compound constitution of the various cement systems, including commercial portland cements. Results obtained by *x-ray* methods are in agreement with those obtained by phase equilibria, chemical and microscopical methods. Each supplements and confirms the other and taken together, the cogency of their findings becomes convincing. These findings define the major constitution of Portland cement clinker, and indicate that the most abundant constituents are tricalcium silicate and beta dicalcium silicate;

that there are normally present, in addition, tricalcium aluminate, tetracalcium alumino ferrite and magnesia; and that free lime is not normally present in amounts as great as 2.5 per cent.

The revised procedure for determining free lime in portland cement (*Industrial and Engineering Chemistry*, Analytical Edition No. 2, p. 296, 1930), and the method of calculation of compounds in portland cement (*Industrial and Engineering Chemistry*, Analytical Edition No. 1, p. 192, 1929) are being used to an increasing extent in the control of the manufacturing processes for portland cement.

Studies of the influence of magnesia, ferric oxide, and soda upon the temperature of liquid formation in portland cement mixtures (Bureau of Standards, *Journal of Research*, January, 1930, p. 55) show that the temperature of liquid formation was reduced over a range from 1455 deg. C. to 1375 deg. C. according to the component introduced and with all three components the temperature was lowered to 1280 deg. C.

The Committee on Cement (Am. Soc. Testing Mats., *Proceedings*, vol. 30, I, p. 420, 1930) presents in tabular form information supplied by manufacturers on the characteristics of masonry cements. The wide variation in the character of this type of cement and in the properties indicated for this product in the replies, are cogent arguments why there should be a standard for this commodity. The cement committee has recently been reorganized and studies of the masonry and plastic cements, whose use is growing so rapidly, are now under way looking toward the development of a specification within the year.

Concrete.—Interest has recently been evidenced in the development of a lightweight concrete. E. E. Richart and V. P. Jensen (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 674, 1930) have made tests on plain and reinforced Haydite (burnt-shale aggregate) concrete using fine and coarse Haydite, natural sand and coarse Haydite, and for comparison purposes sand and gravel or broken limestone. Gravel and Haydite concrete were found to have approximately the same relation between water-cement ratio and compressive strength. There was no indication that the strength of any of the mixtures was limited by the strength of the aggregate particles. The ratio of bond resistance to compressive strength at 28 days was about the same for like mixes of Haydite and gravel concrete. The modulus of elasticity, however, was markedly lower than that of gravel concrete. For considerable range of mixes and consistencies the values of initial modulus of elasticity for concretes made with coarse Haydite and natural sand are about 75 per cent and for concretes made with all Haydite aggregates about 55 per cent of the values for sand and gravel concretes of the same strengths. The weight per cubic foot of the Haydite concretes used varied from 93 to 106 lb. for all-Haydite concrete and from 112 to 126 lb. for concrete made with sand and coarse Haydite.

The use of reinforced Haydite concrete has introduced various problems in design and construction and the same authors have continued their studies (Am. Concrete Inst., *Journal*, October, 1930, p. 151) to determine its action in structures, methods of quality control, properties affecting strength and particularly the effect of the lightness in weight and the low modulus of elasticity on the economy of design. The future of the Haydite concrete structure may lie in the possibility of increased building heights, the use of cheaper types of footings, the possibility of greater panel sizes, and the utilization of insulation properties of the material. The saving of weight in a structure such as in a bridge floor or in a longspan roof is of very obvious advantages. Both the properties of the material and its economy in design remain to be explored more fully.

It has long been recognized that concrete is not perfectly elastic and when subjected to stress continues to yield or deform over a long period of time. R. E. Davis and H. E. Davis report studies (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 707, 1930) of deformation (designated "flow") due to stress sustained over a considerable period of time. The specimens were initially stressed in a testing machine, and this stress was maintained by means of one or more car springs held in compression by a system of rods and plates. The specimens could be moved about and into specially insulated rooms where the temperature did not vary more than 1 deg. F. from a standard nor the humidity more than 1 per cent. The following principal conclusions appear to be justified: (1) the flow of concrete is greater for a lean mix than for a rich one; (2) for the same richness of mix the flow is greater in a concrete for which the aggregate contains a large amount of fines; (3) limestone concrete flows the least, sandstone and basalt concretes the most, while granite and quartz concretes exhibit flows of intermediate magnitude; (4) flow is materially influenced by moisture conditions, rising as humidity decreases; (5) the greater the age at the time of applying the sustained load the less the flow, while the higher the sustained stress the larger the flow; and (6) compressive reinforcement acts materially to reduce both flow and shrinkage.

Studies of the resistance of portland-cement concrete to the action of sulfate waters (see THE AMERICAN YEAR BOOK, 1928, p. 633) have been continued by D. G. Miller (Am Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 636, 1930) to determine the effect on strength and resistance to sulfate waters of concrete cured in water vapor at temperatures between 100 and 350° F. The results indicate that from the standpoint of strength little is to be gained by curing concrete in water vapor much above 155° F. and that increasing the length of time of curing beyond 48 hours has little influence on the compressive strength. From the standpoint of resistance to sulfate waters the temperature of the water vapor and time of curing have a very positive influence. Nothing is to be gained until a temperature of 212° F. is reached, and at temperature of 212° F. and upwards markedly increased resistance to action of sulfate waters was noted with the data definitely indicating increase of resistance with increase of curing temperature between 212 and 285° F. for a 12-hour period. At a temperature of 212° F. concrete increases in resistance with increase of curing period up to six days.

The increasing use of ready-mixed concrete and development of central mixing plants during the past few years has necessitated a revision of the general ideas concerning the specifications for and the mixing and handling of concrete. This increase is due in a measure to the distinct advantage to the engineer and builder of the use of this type of concrete which has already become an important factor in building operations. Most architects or engineers use a general specification for plain and reinforced concrete based on the Joint Committee Report which is relatively complete in regard to requirements for materials, proportions, mixing, quality of concrete, placing of concrete, and other items. The requirements necessary under most of these items for ready-mixed concrete are no different to secure good concrete than for job-mixed concrete. However, the architect or engineer is still conservatively inclined to use job-mixed concrete rather than the recently developed ready-mixed concrete and, consequently, a proposed specification for ready-mixed concrete has been developed (Am. Concrete Inst., *Proceedings*, vol. 27, 1930) covering the special conditions affecting the use of central plant-mixed concrete and central plant-proportioned truck-mixed concrete intended to be used as a supplement to the requirements of the Joint Committee Specifications for Plain and Reinforced Concrete.

Gypsum-Fiber Concrete. — Gypsum-fiber concrete, a combination of wood shavings with gypsum as a binding medium, is used for pre-cast and poured-in-place, floors and roofs similar to concrete and has the advantages of lightness and quick set The use of this material increased at such a rate in the last few years, that it became desirable to include requirements in building codes and, due to the lack of design, information and data on which building-code requirements might be based, an investigation was undertaken (Am. Soc. Testing Mats., *Proceedings*, vol. 30, I, p. 719, 1930) on two types of gypsum-fiber concretes; namely, 2 per cent by weight of wood shavings and the other approximately 12½ per cent. Consistencies of 50, 60, 70 and 80 per cent water were used. The compressive strength results were as follows: 3 per cent chips, 800 to 1,300 lb. per sq. in., the higher strengths corresponding to the drier mixes; 12½ per cent chips, 450 to 600 lb. per sq. in. The modulus of rupture for 3 per cent chip mixtures varied from 210 to 310 lb. sq. in. and for 12½ per cent chip mixtures from 110 to 170 lb. per sq. in. The modulus of elasticity range of 3 per cent chip mixtures was 580,000 lb. per sq. in. and of 12½ per cent mixtures from 200,000 to 300,000 lb. per sq. in.

Paints.—Hiding power of white pigments or paints, the ability to hide or cover the background on which it is placed, has been of great importance to the paint industry for many years and, since the measurement of this property is difficult and complicated, paint and pigment technologists have had to measure other properties similar to hiding power; for example, tinting strength, gloss, and opacity to transmitted light. A. H. Pfund, of Johns Hopkins University, who developed the cryptometer generally used for measuring hiding power, describes a precision cryptometer (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 878, 1930) which he is developing to eliminate the personal equation now involved in determining the exact point at which the division line between the black and white background disappears. The instrument makes use of the sensitivity of the photoelectric cell, which indicates differences in intensities over the black and white areas by relative deflections of a galvanometer.

Several other papers (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, pp. 884-923, 1930) on this subject discuss a method which establishes relationships between hiding power and tinting strength by means of which tinting strength determinations can be accurately and readily calculated into hiding power units; a practical brush-out test using a checkerboard of black and white linoleum which gives results that parallel but do not equal the cryptometer values; and method and apparatus for measuring gloss which has given satisfaction over the entire range from flat to very glossy surfaces.

A procedure for evaluating paint service involving a description of changes that take place during exposure, extent of the changes and an interpretation of their significance in terms of practical serviceableness is described by F. L. Browne (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 852, 1930). The three indexes of serviceableness are appearance, which measures the ability of the coating to hide the underlying surface and maintain an arbitrarily chosen color; integrity, which measures the ability of the coating to remain intact as a continuous film covering the surface; and protection, which measures the ability of the coating to protect the underlying materials from weathering. Failure in one of the three measures of serviceableness necessitates repainting and therefore determines the durability of the coating. Serviceableness, rated either good, fair, poor, or bad at inspections, is defined in such a way that results of inspections at different times or places can be compared.

Rosin.—Although rosin has been used for a number of years, there has been a scarcity of reliable data, and in order to make available what information has been developed a Rosin Symposium (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II p. 794, 1930) was held covering certain specific uses of rosin. This symposium describes the uses of rosin in paints and varnishes, in rosin esters, as a linoleum component, in rubber and reclaimed rubber, in cable impregnating compounds, in insecticides, disinfectants, fly paper, and in rosin oil and core oil, and shows that in many instances, because of its peculiar properties, it could not satisfactorily be replaced by any other material. Since rosin cannot be considered a definite chemical composition, as natural rosins are more or less a combination of compounds, it is rather difficult to write specifications for its purchase.

TESTING

Strain Gauge.—There has existed for a long time a need for an instrument that would determine stress accurately in mechanical structures not only under static but also under dynamic conditions. A new tool for the delicate measurement of strain that has simplicity, ruggedness and sensitivity is described by J. P. Shamberger (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 1041, 1930). This instrument, a magnetic strain gauge, can be used for measuring strain and therefore determining stress under dynamic conditions in structures such as railroad rails, bridge members, wheels, shafts, etc. The gauge depends for its operation upon the change in the reluctance of two magnetic circuits as an armature is moved in an air gap. In dynamic testing an oscillograph having a damped element and an alternating current field is used while in static testing the oscillograph is replaced by a copper oxide rectifier and direct current milliammeter.

Thermal Transmission of Fabrics.—An apparatus which permits of rapid and accurate measurements of thermal transmission of textile fabrics under conditions similar to actual service is described by Ephraim Freedman (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 1025, 1930). The material under test, wrapped on the outside of a calorimeter containing an electric heater, is exposed to temperatures from 20° to 100° F. in moving air of wind velocities up to 25 miles per hour. Results are reproducible between 1 and 2 per cent and the method warrants further tests on thermal transmission of textiles with air cushion between fabric and calorimeter and for rate of moisture evaporation. The apparatus may also prove of value in determining thermal transmission of pipe coverings.

Fatigue Tests of Welds.—With the increasing use of welding in structures subjected to repeated stress it has become necessary to make some studies on the fundamental properties of welded joints in fatigue. In a fillet-weld test program described by R. E. Peterson and C. H. Jennings (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 384, 1930) a limiting size of weld was found, such that for a weld of larger size failure occurs through the parent metal at the base of the weld and for a weld of smaller size failure occurs through the weld metal. In the latter case, failure starts on the inside. It was also found that the fatigue strength of a fillet weld could not be increased appreciably by machining a radius at the base of the weld.

Corrosion.—Investigations of corrosion and corrosion-fatigue of metals (see THE AMERICAN YEAR BOOK, 1926 p. 828; 1928, p. 578; 1928, p. 628; 1929, p. 623) have been continued by D. J. McAdam, Jr., (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 411, 1930) in a study of the effect of the three variables, stress, time, and number of cycles, on the resultant fatigue limit and the interrelationship between the four variables. Results tentatively suggest that stress increases the corrosion rate by increasing the permeability or effective "porosity" of the coating, and the greater stress and stress range the greater is that rate of net damage. The influence of cyclic stress on corrosion may not be due entirely to cyclic distortion of the coating but, especially when the stress range is high, to cyclic cold working of the metal which possibly increases the solution pressure.

Constructive evidence regarding the performance of protective zinc coatings of the hot-dipped type on iron and steel when exposed to the atmosphere and in accelerated tests is reported by C. L. Hippensteel, C. W. Borgmann and F. F. Farnsworth (Am. Soc. Testing Mats., *Proceedings*, vol.

30, II, p. 456, 1930). No appreciable change in rate of loss of weight was found as the zinc and zinc-iron alloy layers of hot-dipped coatings became successively attacked on outdoor exposure. Also no difference between the rate of loss of weight for the hot-dipped, heat-treated hot-dipped, or sherardized coatings was observed. An accelerated laboratory test did not show the same similarity in rates of loss of weight of these different types of coatings as obtained under the particular outdoor exposures. Data from an accelerated outdoor test indicate that the use of an outdoor spray for speeding up normal corrosion rates offers more promise of furnishing reliable information concerning zinc coatings than any laboratory accelerated test yet studied.

A method of obtaining the required number of observations for a desired accuracy in the mean of experimental data, assuming that the data shows no evidence of an assignable cause of variation, is described by C. H. Humes, R. F. Passano and Anson Hayes (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 448, 1930). Studies made of corrosion data obtained in immersion tests of iron and steel indicate that the standard deviation is an important statistic and should be given more consideration. Experience with atmospheric, underwater, underground, and more complicated services of sheet metal, indicate that failures are distributed in such a way that the standard deviations encountered lie generally between 5 and 30 per cent of the arithmetic mean. In planning experiments, one must have some *a priori* knowledge of the conditions or be in a position to estimate a likely value for the standard deviation.

Workability of Concrete.—The determination of the workability of concrete mixtures (see THE AMERICAN YEAR BOOK, 1928, p. 633) has been the subject of much investigation during the past few years. W. F. Purrington and H. C. Loring, continuing their investigations by measuring the power consumed in mixing (Am. Soc. Testing Mats., *Proceedings*, vol. 30, II, p. 654, 1930) report studies of the power consumption of mixing concrete of 2,000, 3,000 and 4,000 lb. per sq. in. design strength; power consumption of concrete at varying consistencies and the variations in the relative workability of standard portland cements. The machine described uses the principle of shear and results can be duplicated without difficulty. The machine can be utilized also to study the speed-power relation which it is believed is important to consider when workability is under discussion. Variations in mix, such as different water-cement ratio designs and consistencies, can be studied and their results can be reported in definite terms of power consumption.

Weathering Tests (Freezing and Thawing).—The study of a possible relationship between resistance to freezing and thawing of saturated brick and their percentages of absorption (see THE AMERICAN YEAR BOOK, 1929, p. 628) continues to be of importance. L. A. Palmer and J. V. Hall (Am. Soc. Testing Mats.. *Proceedings,* vol. 30, II, p. 767, 1930) present results of studies on four different types of brick made from clay and shale subjected to alternate freezing and thawing cycles while saturated. The bricks were weakened relatively less in flexural than in compressive strength by the exposures to freezing and thawing, which tended to reduce the compressive strengths of the bricks in all cases, but to a more noticeable extent among those bricks of the higher absorption range. From the results obtained, there is no evidence that is in conflict with the belief that absorption is not a reliable index to the weather resistance of brick made from clay or shale.

STANDARDIZATION

The standardization activities during the past year of the American Society for Testing Materials, which devotes its major energies to this work, have been of outstanding importance as evidenced by the fourteen new specifications, nine methods of test and one list of definitions, the forty-five tentative standards advanced to standard and the fifty-five revised standards that were approved. The

Book of A.S.T.M. Standards, a triennial publication, containing 427 specifications, methods of testing and definitions relating to metals and nonmetallic materials and products, was also issued this year.

A specification for high-early strength portland cement is an important contribution to the construction field, as are also new specifications for reinforced-concrete pipe and the specifications for reinforced-concrete culvert pipe prepared by the Joint Concrete Culvert Pipe Committee. The standard specifications for portland cement were revised by an increase in the tensile strength on the basis of the general strength level now maintained by the American portland cements. The methods of testing cement were also changed by the inclusion of tolerance for new and used cement testing apparatus.

As the result of coöperation between committees of the American Railway Engineering Association and the American Society for Testing Materials the Standard Specifications for structural wood joist and planks, beams and stringers and posts and timbers have been revised. The strength of clear wood has been added as a factor of strength and green wood is used as the basis of working stresses.

Of particular interest are the revised specifications for copper-base alloys in ingot form for sand castings, covering fifteen different compositions prepared after a review of more than six hundred alloys, and which might be made the basis for trade paper price quotations. In the light metals field, new specifications for magnesium-base and aluminum-base alloy castings and aluminum alloy (duraluminum) sheet have been prepared.

New specifications for austenitic-manganese steel castings are the result of demands for specifications for alloy steels which after consideration indicated that among the various alloy steels this material was the only type in cast form which had found rather wide application and on which composition and production practice was more or less standardized and for which there appeared to be a rather strong demand for specifications.

Of interest to the automative and petroleum industries is the test for dilution of crankcase oil and a test for vapor pressure of natural gasoline. Specifications for gypsum sheathing board, glazier's putty, timber piles, test methods for natural building stone and a flexure test for concrete were new additions to the building materials field.

There has been a growing presentiment that the desired effectiveness in the use of refractory tests in the control of manufacture, inspection and utilization of refractories would not be obtained until all test procedures and methods of reporting data had been put upon a sound statistical basis. Accordingly, there has been prepared a manual for the interpretation of refractory test data containing procedures based on well-established, modern statistical theory and written to meet the needs of refractory engineers, and other technologists, (Reference: Am. Soc. Testing Mats., *Proceedings*, vol. 30, I, 1930; also Index to A.S.T.M. Standards and Tentative Standards).

A construction specification for concrete work on the small job (Am. Concrete Inst., *Proceedings*, vol. 27, 1930) has been prepared for architects and engineers for use on construction contracts where full time inspection is not maintained.

INDUSTRIAL STANDARDIZATION

By P. G. Agnew

Secretary, American Standards Association

GENERAL

During the eleven years of industrial standardization under the American Standards Association 174 American Standards have been approved and 220 projects remain as yet incomplete, 13 of which are revisions. Standards approved cover practically every field of engineering and industry, from the rock dusting of coal mines to specifications for screw threads for bolts and nuts, from specifications for dry cells and batteries to safety codes for abrasive wheels and for mechanical refrigeration. One of the projects recently approved for study is a safety code for grandstands, while another concerns the standardization of foundry equipment. These selected subjects indicate the broad scope affected by national standardization.

APPLICATION TO INDUSTRIAL ECONOMY

Transport Airplanes.—Standardization is one of the important factors in bringing about industrial efficiency. Its practical application to individual manufacturing problems means the savings of hundreds of thousands of dollars annually to both industry and the consumer. Examples will illustrate the far-reaching effects in various kinds of production. Early in 1930 a large producer of multimotored transport airplanes announced a price cut to $23,900 from $41,900—a reduction of $18,000 per unit, made possible, as stated by the vice-president, "by the standardization of plane parts and accessories, and because of mass production." It was further remarked that the price cut would reduce costs to operators and bring down fares within a short time. Not long after this announcement, airplane fares of many lines were appreciably reduced, thus completing the cycle, showing how the effect of standardization reaches through to the ultimate consumer.

Automobiles. — Manufacturers of automobiles were among the first to reap the practical benefits of standardization. In this field alone it was reliably estimated that coöperation among large makers of cars lowered the cost to the public of one year's output of automobiles by $840,000,000, which would not have been saved had there been no general agreement among manufacturers that sizes of minor parts and fittings be reduced to the fewest possible. Put in another way, it has been stated that if automobiles were hand-made and there were no standardized parts, $10,000 would be a cheap price for a good lightweight car, but, because of standardization, one can be bought for less than $1,000 dollars.

Electric Lighting.—Perhaps the most commonly appreciated illustration of economy through standardization is to be found in the incandescent electric light bulb. By means of standardization, not only has there been a steady improvement in efficiency but heavy reductions in selling price. Costs to the ultimate consumer have been reduced about 53 per cent since 1914 and 50 per cent since 1920. Standardization of lamp voltages within a range of 100 to 130 volts in 1914 reduced the number in common use from 20 to 5. Similar action in 1924 further reduced this number to 3.

Building Trade.—In the building trade, the director of the American Institute of Steel Construction estimated that standardization saved builders in the United States "approximately $13,000,000 a year, estimated on the average yearly contracts."

SIGNIFICANCE OF STANDARDIZATION

Viewed in its largest aspect it may justly be said that standardization provides a common language for the buyer and the seller and therefore promotes fairness in competition. As has been illustrated above, it lowers unit costs in various ways; first, because it makes it possible to manufacture for stock (which incidentally helps to stabilize both production and employment), and second, because it decreases selling expense by focusing on essentials. Another result of standardization is that by eliminating indecision both in production and utilization, it allows more thought to be put on designs because of concentrating on fewer lines. Furthermore, it stimulates research and development and helps to get the results of research into actual use in industry. It does away with uneconomical practices that have resulted from accident or tradition. It will be evident from these facts that the whole trend is to base competition squarely on efficient production and distribution and the intrinsic merit of the product.

STANDARDIZATION DEVELOPMENT

Preferred Numbers.—Like research, standardization began as an individual matter taken up by forward-looking individuals or companies that recognized the practical benefits that might result from it. For example, the first instance of the recognition and successful application of the theory of preferred numbers (which is now followed to advantage in several industries) may be attributed to Col. Renard of the French army whose observation in 1875 of the use of 425 different kinds of cables for mooring captive balloons led him to study the matter as primarily a mathematical problem. His study resulted in the theory of preferred numbers and by applying the theory the 425 different cables were reduced to 17. Incidentally, this theory has been found to have almost the validity of a natural law because it can be applied to so many widely differing problems. Basically, it establishes what the variation in size should be between the smallest and the largest of a series. Today, practically all large industries follow standardization in their manufacturing processes in one way or another because they have found it an essential element in America's chief contribution to industry—mass production.

Extent of Movement.—As soon as technical and trade associations were formed they saw the value of standardization and urged its application to their members' problems. It was found that standardization could not attain its greatest effectiveness unless treated as a national problem because the scope of most standardization matters affects not one industrial group, but several. For example, many different industries are concerned with screw threads, dimensional standards of cut and ground taps, the safety code for the use of abrasive wheels, and dimensional standards for ball and roller bearings. Not only has the movement on a national scale developed in the United States, but national standardizing bodies have been established in all of the more highly industrialized countries of Europe. This in turn led to the development of the International Standards Association which at present includes 18 countries in its membership. While the earliest concern about standards was primarily the technical man's problems, it soon grew into a managerial problem of the first water, so that today the work of the American Standards Association is under the direction of some of the most able industrialists who give generously of their time, energy and thought to the satisfactory solution of national standardization matters.

GOVERNMENT COÖPERATION

Since the Government is one of the largest purchasers in the country, it has always been very active in standardization work not only for the purpose of buying advantageously but also as an aid to industry and the public. Various Government departments are concerned with one or another aspect of standards. The Federal Specifications Board acts really as the unifier of specifications for all the purchasing branches of the Government. The coöperation between the American Standards Association and the Bureau of Standards, which includes the Division of Simplified Practice, a Division of Specifications and the Division of Trade Practices, has given a beneficial impetus to the movement. Various branches of the Government are actively coöperating in the work of the American Standards Association and six executive departments are member-bodies with representation on the council. The original purpose of the formation by industry of the American Standards Association was to provide a recognized medium through which industry could exercise its control over industrial standardization matters, in keeping with our long established theory of the maximum freedom for private industry from government control or supervision.

AMERICAN STANDARDS ASSOCIATION

Purpose.—In 1928 the American Engineering Standards Committee was reorganized along broader and more flexible lines to embrace a more inclusive industrial scope, and the name American Standards Association was adopted. It stands today as the recognized medium through which national American Standards are promulgated. The Association is essentially an industrial legislature which brings together all those directly concerned with a project to study a specific problem, to formulate a workable and acceptable standard and submit it for approval to an authorized committee, so that when the committee has given its approval, the Association is certain that the standard represents a real national opinion. Any responsible company or recognized unit can request the initiation of a project under American Standards Association procedure.

Scope.—More than 500 companies or groups are coöperating in its work and the membership of its technical committees who study and formulate national standards includes approximately 2500 executives from practically every branch of industry.

Individual Standardization.—Work on individual standardization projects is handled chiefly through technical committees made up of accredited representatives of all interested groups, including manufacturers, employers, distributors, technical bureaus of the Federal Government, technical and other associations.

Procedure. — Sometimes subcommittees are appointed to study and discuss details; sometimes this work is done by entirely separate bodies or individuals. In either event, the strong preponderance of committee opinion must be favorable before the matter is referred back to the sponsor for submission to the Association for approval. Very frequently standards that have been developed by other associations and societies (such as the American Society for Testing Materials, the American Society of Electrical Engineers—to mention only a few) are submitted to the American Standards Association for approval as American Standards with the purpose of giving them a nationally recognized standing.

STANDARDIZATION CLASSIFICATION

Approved Standards.—The 174 American Standards already approved cover the following classifications: civil engineering and building trades, mechanical engineering, electrical engineering, automotive (automobile and aircraft), transportation, ferrous metallurgy, non-ferrous metallurgy, chemical, mining, wood, pulp and paper and textile industries.

Completed Projects.—Typical of the projects completed is that on screw threads which concerns practically every industry. The approval of standard screw threads for fire hose couplings had far reaching effects in preventing conflagrations and saving human lives by making it possible for couplings of one city or township to be used on hydrants in another city. Standard dimensions of track bolts and nuts, which is of special importance to railroads, was approved in 1930. The safety code for mechanical refrigeration and the recommended practice for fire fighting equipment in metal mines have both been favorably commented on as being much needed. They represented exhaustive study over a long period of time. New projects include specifications for trolley, storage battery and combination type locomotives for coal mines; installation for domestic gas burning appliances; and a revision of the project on tolerances, allowances and gages for metal fits.

Safety Codes.—The Association has approved a total of 36 safety codes applicable to such matters as abrasive wheels, aeronautics, elevators and escalators, floor and wall openings, power presses, textile mills, hand and foot presses, colors for traffic signals, and the use of explosives in bituminous coal mines. At the 1930 convention of the Association of Governmental Labor Officials in Industry a resolution was unanimously passed recommending that in the formulation of safety regulations and the adoption of specific safety devices consideration be given to the various safety codes approved by the American Standards Association.

INTERNATIONAL COÖPERATION

International standardizations came into being with the formation of the International Standards Association in Zurich, Switzerland, early in 1929, and while still in its infancy it has already done notable work on ball bearings. Over 50 of the more important sizes of ball bearings are now standard throughout the world and are completely interchangeable. Other subjects having international attention are screw threads, shaft heights for electrical machinery, couplings, grinding wheels, pipe, and nomenclature and methods of test of petroleum products. The international secretariat for this latter project was assigned to the American group at the Paris Conference held in May, 1930. The American Standards Association has a representative on the International Standards Association Council as of Jan. 1, 1931. The subject of agricultural machinery and implements has had the benefit of international coöperation for some time. Through the American Standards Association, this matter was brought to the attention of the principal American interests and it has been asked to submit material on this subject to a conference of agricultural machinery manufacturers' representatives. The importance of national coöperation in this field is self-evident.

COMMERCIAL AVIATION

By Andrew F. Haiduck

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GENERAL

The year's progress in commercial aviation has been marked particularly by continued development of scheduled air transportation of mail, passengers and express, despite the general business depression. Those air lines that render a service clearly advantageous in time over other means of transportation, or which advantageously augment surface transportation, did a substantial business. More than 1,000,000 persons in the United States rode as passengers in airplanes during the first half of 1930 according to surveys of scheduled and miscellaneous flying operations. Air mail poundage also increased during this six-month period over the similar period in 1929, but not in so great a degree as did passenger traffic. The total number of miles flown by American aircraft in all types of operation was 68,669,928. Aircraft production has been somewhat curtailed to conform to the downward trend of business. This curtailment, however, has relieved the aircraft manufacturer of some of his surplus production of 1929.

AIR MAIL AND TRANSPORT

Probably the most important event in the 1930 history of air transportation was the enactment by Congress of the Watres Bill which provides an entirely different premise for payment for the movement of mail by private contractors. It places it on passenger lines, and has a definite tendency to eliminate the exclusive air mail carrier, and convert him into a passenger carrier as well. Also it puts air mail on the existing passenger lines which will receive so much per mile, according to the amount carried, for the movement of the mail. Further, the bill will give a wider and more diversified air mail service throughout the country, and will allow passenger lines to exist and develop their business. While the total amount of dollars paid to the air mail contractors will not be less, a much greater service will be received for the payments made. It is a desirable piece of legislation, and will be of inestimable value to the air transport industry.

PASSENGER TRANSPORT

American Supremacy.—At the present time there is not any country, or combination of countries that has an air transportation system comparing with that of the United States, and the potentialities for this industry in the United States exceed by far those of any other nation. Something the air transport operators are doing here, which is not done elsewhere in the world, is maintaining schedules throughout the twenty-four hours of the day over three mountain ranges, with a record exceeding 90 per cent of the trips completed.

Passenger Traffic.—Miscellaneous operators carried 924,800 passengers and scheduled air transport lines (domestic and American operated into foreign countries), carried 208,357 passengers during the first six months of 1930. The total for all operations from January to June, 1930, was 1,133,157 passengers. Scheduled air lines also carried 3,761,376 pounds of mail and 1,245,477 pounds of express. The total of 208,357 passengers carried on the scheduled airlines in the first six months represents a fourfold increase over the number carried in the corresponding period in 1929. The number of passengers flown in scheduled operations during the entire year of 1929 was 173,405.

AIR MAIL AND EXPRESS

Air mail poundage also increased during the six months over the similar period in 1929, but not to such a marked extent as did passenger traffic. The air lines carried 3,761,376 pounds of mail from January to June, 1930, as against 3,468,562 pounds, during the first six months of 1929. The mail poundage figures for January to June, 1930, includes 3,571,956 pounds of domestic air mail, and 189,420 pounds of foreign air mail to Latin America, Canada, and Alaska.

Air express increased from 976,213 pounds carried in the first half of 1929 to 1,245,477 pounds in the first half of 1930. Most of the express was carried on domestic lines which flew with 1,242,458 pounds. The foreign lines contributed 3,019 pounds to the total.

Flying Mileage.—The total miles flown by scheduled air transport planes for the 1930 period was 16,902,728, of which 14,595,915 was on domestic lines and 2,306,813 on foreign lines. In the same period of 1929 the miles flown were 9,201,338. This is an increase of approximately 84 per cent. The figures on scheduled airway operations are based on reports from 38 operators flying 27 routes into Canada, Latin America, and Alaska.

AIRPORTS AND AIRWAYS

Construction Progress.—Progress of airport construction during 1930 has been comparatively steady. In fact this field of aeronautics has been one of the healthiest from the viewpoint of uninterrupted development during the contemporary period of depression. On Oct. 15, 1930, there were a total of 1792 airports in the United States. A detailed tabulation of the type and number of each type of airport follows:

Municipal Airports	521
Commercial Airports	575
Dept. of Commerce Intermediate Fields	324
Army Airdromes	64
Naval Air Stations	12
Marked Auxiliary Fields	294
Miscellaneous	2
Fields with Night Flying Equipment	614
Total	1,792

Airport Development.—Some of these airports are the equal, if not better than any of the famous airports of Europe, such as Croydon, Templehof, or Le Bourget. The airport is no longer just an expanse of open ground for the landing and taking-off of planes, but a modern well-organized terminal for scheduled transportation. Transportation from the airport to the business center which is served by the airport is furnished by all operators. Planes now arrive and leave on schedule with a maintenance of schedule of over 90 per cent. Uniformed attendants, commodious waiting rooms, and no evidence of doubt as to what happens next, now make the airport a modern terminal for the fastest mode of transportation. At present commercial fields outnumber the municipal airports by 11 per cent after having been 18 per cent behind in 1928.

Airways and Equipment.—The Federal airway system is being developed in accordance with well defined plans which contemplate 25,000 miles of lighted airways. Approximately 15,000 miles of airways are now equipped for night flying out of a total of 49,529 miles in operation. At the close of the fiscal year ended June 30, 1930, there were 1477 airway beacons, 303 airway weather reporting stations, 35 airways radio communication stations, and 9 radio range beacons in operation. In addition there were under contract with the work of installation in various stages of completion 1,728 miles of airways on which are being established 36 intermediate fields and 223 airway beacon lights. Five thousand six hundred and fifty miles of airways were equipped with automatic telegraph-typewriter circuits which collect and disseminate weather information and thirteen radio broadcasting stations were placed in operation for the broadcast of this weather information to planes in flight at regular intervals both day and night.

Plans and Appropriations.—As the foregoing aids to air navigation not only have justified their existence, but have proved to be indispensable from the standpoint of safety and reliability of aircraft operation, appropriations have been made to provide more of these facilities. The plan for the fiscal year beginning July 1, 1930, includes the lighting of 3,000 miles of additional airway, 33 additional radio range beacon stations, 2,800 miles more of automatic telegraph-typewriter circuits and 20 more radio communication stations. Upon the completion of these 20 additional radio communication stations, there will scarcely be a square mile in the United States where flying is a regular activity that a pilot can not receive broadcasts of weather information while in flight.

TRANSPORTATION SERVICE

Through-plane Routes.—In addition to the combined air-rail service established in 1929, there are now 2 new transcontinental mail and passenger routes operating on a 36-hour schedule from coast to coast. The trip is made entirely by plane. This is an 8-hour reduction over the combined air-rail means of transportation.

Transoceanic Project.—That air transportation will shortly be transoceanic as well as transcontinental is evidenced by the fact that there are now at least three projects under way for air service between North America and Europe. One contemplates an airway by way of Greenland. An English expedition is making an exhaustive study of meteorological and terrain conditions with such an airway in mind. Another project proposes the use of several floating islands anchored by the Atlantic along the proposed line of flight. One of these islands called a seadrome is now in the process of construction, and will be put into experimental use between the United States and Bermuda sometime in 1931. The third project which contemplated the use of dirigibles received somewhat of a setback on account of the R-101 disaster.

Miscellaneous Operations.—Aircraft engaged in miscellaneous flying, which includes such operations as experimental, exhibition, industrial, student instruction, and pleasure flying, as distinguished from operations on scheduled air lines flew 51,767,200 miles in the first six months of 1930. This was an increase of 4,767,200 miles over the corresponding period in 1929. The total number of passengers carried for hire by miscellaneous operators was 716,400 from January to June, 1930. Passengers taking pleasure flights for which no fare was paid numbered 208,400 making the total number of passengers carried in miscellaneous operations 924,800.

AIRCRAFT PRODUCTION

Aircraft for Civil Use.—Airplanes manufactured in the United States for civil use in the first nine months of 1930 totaled 2,154 according to a report issued by the Aeronautics Branch of the Department of Commerce. The report states that these airplanes were manufactured by 296 companies or individuals. Thirty-eight companies manufactured more than ten aircraft each; three companies built more than 100 planes; six companies built between 50 and 100 planes, fourteen companies built between 20 and 50, and fifteen companies built between 10 and 20 planes. The total number of civil aircraft produced in 1929, the peak year for all aircraft production in the United States, was 5,357. It is estimated that production figures for the entire year of 1930 will be less than 50 per cent of the 1929 total. A comparison of yearly production since 1927 follows:

	(1927)	(1928)	(1929)	1st 9 months 1930
Civil Aircraft	1,653	3,885	5,357	2,154
Military Aircraft	700	1,094	590	556
Total Aircraft	2,353	4,979	5,947	2,710

Military Aircraft.—In addition to the 2,154 aircraft manufactured for civil use, 556 military aircraft were delivered to the Army and Navy during the nine month period, which places the total production at 2,710 of these aircraft. One hundred and ninety-eight were exported.

AIRPLANE PRODUCTION

(January 1.-September 30, 1930)

Monoplanes		
Open Cockpit (Landplane)		
One place		269
Two place		141
Three place		35
Total Open		445
Cabin (Landplane)		
One place		1
Two place		95
Three place		25
Four place		239
Five place		3
Six place	(A)	52
Seven to ten place	(B)	32
Over ten place	(C)	21
Total Cabin		468
Flying Boats	(D)	6
Convertibles		9
Amphibians	(E)	17
Total Monoplanes		945
Biplanes		
Open Cockpit (Landplane)		
One place		26
Two place		313
Three place		502
Five place		5
Total Open		846
Cabin (Landplane)		
Three place		1
Four place		2
Five place		6
Six place		5
Seven place		2
Eight place		1
Total Cabin		17
Flying Boats		18
Convertibles		50
Amphibians	(F)	56
Total Biplanes		987
Planes manufactured for experimental purposes		24
Military airplanes deliveries		556
Airplanes exported	(G)	198
Grand Total		2,710

Notes—A 1 multi-engine plane. B 6 multi-engine planes. C 20 multi-engine planes. D 5 multi-engine planes. E 2 multi-engine planes. F 10 multi-engine planes. G Does not include planes manufactured during 1929 that were exported during the first nine months of 1930.

AIRCRAFT MANUFACTURE AND EXPORTS

Manufacturing Development.—In 1928 a substantial portion of the large number of aircraft manufactures were made up of small local companies. Some were hastily formed for the purpose of supplying a demand for conventional aircraft which then seemed apparent. Limited financial background together with slight preparations made it obvious that they could not weather any unfavorable change in conditions or circumstances. This has proved to be the case, and 1930 saw the industry contracting itself into a smaller and highly specialized group surrounded by the very best engineering, production, and marketing personnel. At present, the manufacturers are paying strict attention to the needs and desires of an intelligent and discriminating aircraft market. They are making every effort to design and produce aircraft which their experience and studies have indicated are required by such a market. At the same time they are projecting plans or new developments, new designs, and new features to keep in the van of public desire.

Exports of Engines and Parts.—No great change is evident in the quantity and value of aircraft engines and parts exported for the first eight months of 1929 and 1930. Cumulative figures are given below:

	1930	1929
Number of aircraft...	237	240
Value of aircraft.....	$3,552,863	$3,965,129
Number of engines....	253	237
Value of engines.....	$1,116,927	$1,029,453
Value of parts.......	$1,544,930	$1,475,288

AIR ACCIDENT RECORD

A civil aircraft accident report for the first six months of 1930 shows that the number of miles flown per fatal accident in miscellaneous operation increased almost three-fold over a corresponding period in 1929, while the miles flown per accident of any kind in scheduled operations more than doubled. In scheduled air transport operations the first half of 1930 there were 16,902,728 miles flown and as there were only six fatal accidents the mileage flown for each accident was therefore 2,817,121. In 1929 for the same period there were 9,201,338 miles flown and nine fatal accidents which placed the miles per fatal accident at 1,022,371. Considering all classes of accidents in scheduled air transport operations (fatal, nonfatal and accidents involving no injuries whatever), the miles flown per accident totaled 384,152 for 44 accidents. For the corresponding period in 1929 the total number of accidents was 61 which placed the miles per accident at 150,842.

DESIGNS AND TECHNICAL DEVELOPMENTS

Streamlining.—Increased efficiency and speed of the airplane has been obtained largely by attention to details during the past year. More attention has been given to streamlining than ever before with a consequent increase in high speeds as well as cruising speeds. All protuberances in the air stream have either been removed or faired. Streamline pants in conjunction with a Townend Ring have increased the top speeds of commercial airplanes from 10 to 15 miles per hour. In the case of one particularly efficient airplane the external supporting struts have been fabricated in the form of an auxiliary wing, thus obtaining more lifting area having less drag than the usual structure of supporting struts.

Propeller Gearing.—The more general use of reduction gearing for propellers with a subsequent reduction in tip speed has been another factor making for better efficiency. Gearing has also reduced the aerodynamic interference between the propeller and the body with a resultant increase in propulsive efficiency. Aside from this, the reduction in propeller tip speed has reduced propeller noise considerably and in conjunction with soundproofing has made it possible to carry on a normal conversation in an airplane.

Directional Radio.—The practicability of the use of directional radio as an aid to point-to-point flying has been demonstrated by nearly two years of service given by the radio range beacon system on the Federal airways. By means of this system the pilot can accurately keep on his course, know approximately the points he is flying over and proceed unerringly to his destination. Many flights are undertaken which doubtless could not succeed without the use of radio direction facilities.

Landing Equipment. — Probably the greatest advance in the application of radio to aircraft operation during the past year has been the development of an effective system which permits the safe landing of airplanes at airports under conditions where there is little or no visibility. The additional equipment required on the aircraft for the use of this blind-landing aid is very simple and weigh only 15 pounds.

COMMERCIAL AVIATION IN EUROPE

Germany.—Progress in all phases of aeronautics is evident in Europe and parallels that in the United States. The Luft Hansa operating lines from the central German industrial area to Amsterdam, London, Vienna, Budapest, Marseilles, and Barcelona, now covers 8,500 miles daily, as compared with 7,200 during the winter of 1929. Night flying from Berlin via Hanover to the Belgium frontier has been organized and is of great importance for the Berlin-Amsterdam and Berlin-Paris services. Connections are also maintained to Scandinavia.

France.—Through close coöperation between the air lines operated by Compagnie Generale Aeropostale air mail from Europe reaches Chile in eight and one-half days and Bolivia in eleven days. This is approximately eighteen days less than by other means of transportation.

United Kingdom.—An increase of 20 per cent has been reported in air mail sent from the United Kingdom during the quarterly period ended September, 1930, as compared with the same period in 1929. The London to Capetown, South Africa air service will be inaugurated early in 1931. Equipment for night flying will be installed along the route.

AMERICAN MACHINERY

By W. H. Rastall

Chief, Industrial Machinery Division, Department of Commerce

ECONOMIC FACTORS

Effects of Depression.—In contrast with 1929, 1930 has been a year of marked recession in the machinery industry, and circumstances now make it possible to point out the way in which certain fundamental economic lines effect this important industry. In theory, at least, it will be recognized that industrialists will not purchase factory equipment during a depression. When the business cycle is at its low points those controlling the financial policies of industry almost invariably feel it the part of wisdom to postpone investment in machinery until the situation has clarified at least far enough to relieve the financial pressure on executives. On the other hand, when the business cycle is at its crest, when conditions in all industries are booming, there is an inordinate demand for machinery making it difficult for manufacturers to satisfy the urgent demands of their customers. This theory is very clearly supported by the experience of the last eleven years as illustrated in the chart at the end of this article where the dotted line shows the fluctuations in industrial production as represented by unadjusted figures compiled by the Federal Reserve Bank.

Index of Trends.—If a straight line were drawn as a medium line it will be observed that under boom conditions this curve barely rises 15 per cent or falls more than 20 per cent below such a mean. The dashed line on this diagram represents the orders received for machine tools as reported to the National Machine Tool Builders' Association, and while statistically it is probably bad practice to compare orders with production more perfect data is not available, and this comparison does show the extreme swings experienced by machinery manufacturers in the face of cyclic conditions. It will be noted, for example, that in 1921 under orders for machine tools it falls to a point representing only 8 per cent of the volume received at the peak late in 1919 When an industry is confronted with the sharp rise in volume represented in 1919, and an abrupt toboggan a shown in 1920, it undoubtedly faces conditions that will over-tax the most skillful management, conditions which have been substantially duplicated in the experience of 1928, 1929 and 1930. It will also be observed that following the decline in 1920 the machine tool curve does not approach the curve representing fluctuations in ordinary industrial production for five years, and it does not cross that curve in any definite sense for more than seven years, a circumstance that must profoundly affect the employment policies, the price policies, in fact, all management policies of the machinery manufacturer.

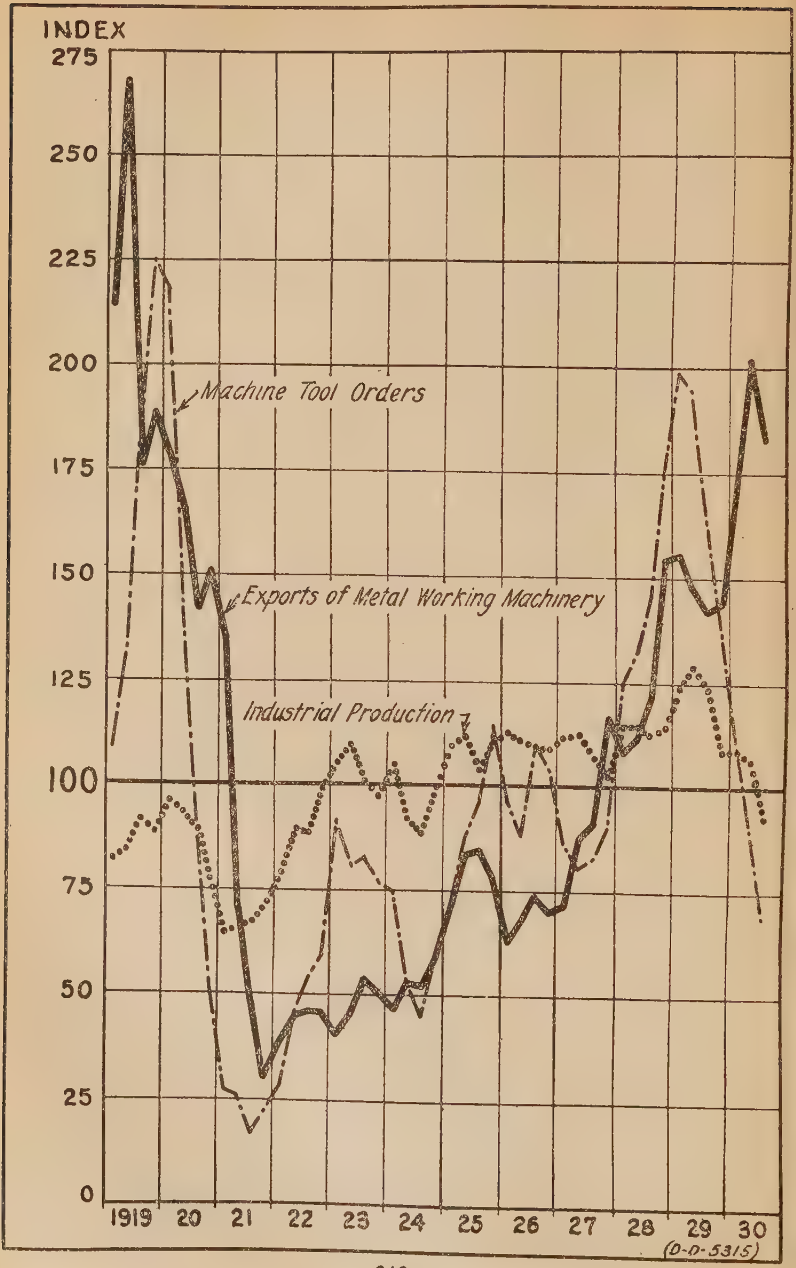
The Industrial Movement.—The machinery building industry has again been through the doubtful pleasures of another hectic period. The going up in 1928-29 was quite pleasant; in fact, throughout the whole of 1929 operations were on an expanded scale because of a back log of unfilled orders, even then toward the end of the year there was a decline in current orders, but 1930 illustrates the way in which the industry is forced to pay for the earlier extravagances, which, it will be noted, are not extravagances of the industry itself but the inordinate demands of their customers. This situation directs our attention to another economic matter. Probably the public generally associates the present depression with the break that was felt in the stock market starting from October 28, 1929, but it will be observed that the approaching collapse in orders for machinery anticipated the stock market break for several months. This suggests that if the machinery manufacturers had but caught the signal that was given it would have been possible for them to acquire untold wealth by selling the market short. As a practical matter it appears that the signal was undetected and they drove by entirely preoccupied with the daily demands of their own business. The incident, however, rivets attention on the suggestion that more careful study of the demand for industrial machinery — capital goods — would give an earlier and more definite indication of approaching recession than the present method of watching for newspaper reports of stock market conditions. It would be exceedingly interesting if we felt it safe to project the future from the past as shown by this diagram, but obviously this is impossible. It is clear that the machine tool industry has been experiencing a very definite business cycle—the low point occurring with surprising regularity every three years, and with this low point occurring in the late summer or early autumn, all in spite of the fact that there is no reason to believe that the machine tool industry is a seasonal trade.

World Industrialization. — The curve reflecting the experience in the exports of metal working machinery has been added to this diagram in order to emphasize that the present depression is a world phenomenon, not merely an American incident. Also this export demand for American industrial machinery reminds us that the world is rapidly becoming industrialized, practically every country being hungry for machinery and usually demanding the best. The United States, with 6 per cent of the world's population, produces about 57 per cent of the world's machinery, consequently industrialists abroad are more and more disposed to insist on using American equipment as representing the greatest advancement of the art.

INDUSTRIAL FACTORS

Profit Experience.—In view of the conditions faced by the machinery industry as revealed in the chart below, a condition which applies to other lines of machinery as well as the machine tool group, it is impracticable to draw any conclusions regarding the profitableness of present operations or the business health of the whole group.

Organization.—Experiences of the type suggested are creating a demand for more perfect organization. Existing trade associations are taking on new activities, probably the outstanding being the decision of the National Machine Tool Builders' As-


INDEX
275
250
225
200
175
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125
100
75
50
25
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Machine Tool Orders
Exports of Metal Working Machinery
Industrial Production
1919
20
21
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30
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sociation to spend $20,000 on market analysis, perhaps the first time such a step was ever taken by a machinery trade association. Other activities are also being raised to a higher level in various departments of the machinery trade associations; also a movement is on foot to organize certain groups that previously have been unorganized.

Technical Progress.—The year has shown at least the usual rate of technical progress. New designs, new methods, new applications have been frequent. In addition, greater attention is being given to the management problems associated with the application of machinery. Questions of over-capacity, depreciation, obsolescence, and the like, are receiving more thorough consideration. Machinery manufacturers and machinery uses appear to be on the point of establishing more methodical equipment policies, better accounting methods, clearer business practices. An impression prevails that along these lines it will be possible to cure at least some of the evils of profitless prosperity

MACHINERY EXPORT TRADE

The export trade for industrial machinery as a whole has expanded from $112,000,000 in 1922 to $257,000,000 in1929, with ups and downs represented roughly by the curve showing the exports of metal working machinery in the accompanying diagram, a truly phenomenal trade. It will be recognized that these exports reached a peak of nearly $1,000,000 a working day, a huge volume of machinery. And expansion continued until about July, 1930, in spite of the fact that world-wide depression set in much earlier. Following July there has been a marked tendency for these machinery exports to decline, but it is in reality surprising that this decline has not been more abrupt and more severe. Present indications are that the total exports of industrial machinery for 1930 will approximate $225,000,000, which, it will be observed, is higher than for any other recent year, barring 1929. In view of the reduced domestic demand, it is obvious that export business will now prove to be of greater interest and greater value to the typical American manufacturer of industrial machinery and this in turn suggests that the time has arrived when machinery manufacturers should again make a careful study of foreign markets for their products. American machinery goes to every country in the world, but the demand, of course, varies widely from country to country, depending upon the types of machinery considered. The European group of markets absorbs metal working machinery while the Latin-American group absorbs mining and construction machinery, and so on. Generally speaking, the Latin-American group of markets absorbs more American equipment than any other group, a trade that is expanding enormously. During recent years the Asiatic markets have been disturbed by local political problems, but perhaps the time has come when more settled conditions should be anticipated and sales efforts released in those markets in order to anticipate the approach of better conditions.

COGNATE SOCIETIES

Allied Building Metals Industries, 10 W. 33rd St., New York City.

American Ceramic Society, 2525 N. High St., Columbus, Ohio.

American Concrete Institute, 2970 W. Grand Blvd., Detroit, Mich.

American Construction Council, 28 W. 44th St., New York City.

American Foundrymen's Assn., 222 W. Adams St., Chicago, Ill.

American Institute of Chemical Engineers, 85 Livingston St., Brooklyn, N. Y.

American Institute of Electrical Engineers, 33 W. 39th St., New York City.

American Institute of Mining and Metallurigical Engineers, 29 W. 39th St., New York City.

American Iron and Steel Institute, 75 West St., New York City.

American Railway Engineering Assn., 431 S. Dearborn St., Chicago, Ill.

American Road Builders Assn., Press Bldg., Washington, D. C.

American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa.

American Society of Civil Engineers, 33 W. 39th St., New York City.

American Society of Heating and Ventilating Engineers, 25 W. 39th St., New York City.

American Society of Mechanical Engineers, 29 W. 39th St., New York City.

American Society of Municipal Engineers, American Society of Naval Engineers, Navy Department, Washington, D. C.

American Society of Refrigerating Engineers, 37 W. 39th St., New York City.

American Society of Safety Engineers, 25 W. 39th St., New York City.

American Standard Assn., 29 W. 39th St., New York City.

American Statistical Assn., 114 Woodward, Bldg., Washington, D. C.

American Welding Society, 29 W. 39th St., New York City.

Building Trades Employers' Assn., 2 Park Ave., New York City.

Committee on Experimental Power, 2 Rector St., New York City.

Engineering Foundation, 29 W. 39th St., New York City.

Illuminating Engineers Society, 29 W. 39th St., New York City.

Institute of Radio Engineers, 37 W. 39th St., New York City.

National Aeronautic Assn., 1623 H St., N. W., Washington, D. C.

National Board of Fire Underwriters, 85 John St., New York City.

National Electric Light Assn., 420 Lexington Ave., New York City.

National Fire Protection Assn., Boston, Mass.

New York Electrical Society, 29 W. 39th St., New York City.

Society for Promotion of Engineering Education, 29 W. 39th St., New York City.

Society of Automotive Engineers, Inc., 29 W. 39th St., New York City.

Society of Naval Architects and Marine Engineers, 29 W. 39th St., New York City.

DIVISION XX

GEOPHYSICAL SCIENCES

DYNAMIC AND STRUCTURAL GEOLOGY

By Kirtley F. Mather
Professor, Harvard University

GENERAL

Geologic surveys in the field have been prosecuted with more than the usual energy during the year because of increased appropriations for the support of the U. S. Geological Survey and because of an increased recognition on the part of financiers of the need for more exact and extended knowledge concerning the natural resources of the United States. Laboratory studies have kept pace with work in the field.

Papers and Maps.—In July, 1929, a geologic branch was established as part of the California State Division of Mines. The state geologist, Olaf P. Jenkins, reports great progress during the first year of the existence of the Survey ("Progress of the Geological Survey of California," *Science*, vol. 72, pp. 528-529, 1930). A new state geologic map is being prepared and the geology of several quadrangles is being mapped.

Crustal Structure.—Considerable attention has been paid to the problems of crustal movement as represented by the folds and faults in regions of complicated structure. The Taylor-Wegener hypothesis and the results of recent detailed studies in the Alps have stimulated the geologists of America to seek more vigorously than ever before for evidences of great crustal shortening, and the impression is forming that Appalachian and Alpine structures may not be so sharply differentiated in kind as had heretofore been supposed.

STRUCTURAL GEOLOGY

Appalachian Structure.—The most notable contribution made in recent years is the "Geology of the McCalls Ferry—Quarryville District, Pennsylvania" by E. B. Knopf and A. I. Jonas (*Bull.* 799, U. S. Geol. Survey). Detailed evidence is presented to demonstrate the great Martic overthrust, a major low-angle thrust which has been traced for over 100 miles southwesterly from the Schuylkill River near Philadelphia, across Pennsylvania and Maryland. The plane of the overthrust has been folded by subsequent movement. The Pre-Cambrian crystalline rocks were pushed northwestward over the Cambrian and Ordovician sediments for a distance of at least eleven miles.

Ouachita Structure.—The "Structure of the Ouachita Mountains of Oklahoma and Arkansas" by H. D. Miser (*Bull.* 50, Oklahoma Geological Survey) and "Geology of the DeQueen and Caddo Gap Quadrangles, Arkansas" by H. D. Miser and A. H. Purdue (*Bull.* 808, U. S. Geological Survey) are important contributions to the structural geology of the Ouachita Mountains. In Arkansas the Paleozoic rocks are intensely folded, but thrust faults are relatively minor features. The Ouachita Mountains of western Arkansas are the roots of a great anticlinorium. In Oklahoma, however, the rocks were not merely folded but were also driven northwestward along four major low-angle thrust planes—the Choctaw, Windingstair, Octavia, and Boktukola thrusts. The minimum horizontal displacement along the Windingstair overthrust is seven miles. Because of the folding and subsequent erosion of this trust plane an excellent window is exposed in the Potatoe Hills. If Miser's suggestion concerning the McCurtin County window is correct, the horizontal displacement on the Boktukola overthrust amounts at least to 25 miles. Miser agrees with Ulrich and Powers that the facies of the rocks in the Ouachita Mountains is very different from the facies in the Arbuckle Mountains. Powers had already suggested that the geosynclinal Ouachita facies had been thrust northwestward over the Arbuckle foreland facies.

Rocky Mountain Structure.—In a paper entitled "The Moyie-Lenia Overthrust Fault", Virgil R. D. Kirkham (*Jour. Geol.*, vol. 38, pp. 364-374, 1930) shows that a number of isolated faults recognized by various field workers in British Columbia, Idaho, and Montana are really parts of one major overthrust for which he suggests the name Moyie-Lenia. This fault strikes in a general northerly direction, dips westerly at angles varying from 45 to 90 degrees, and extends for 118 miles at least. The stratigraphic throw is tremendous, amounting in places to 45,000 feet, but the horizontal displacement is probably slight. All the strata involved belong to the Belt formation. The mechanics of such a fault—steep dip and large stratigraphic throw—are difficult to understand unless the fault originally dipped at a low angle and has since been tilted or folded.

Basin-Range Structure.—W. M. Davis, in "The Peacock Range, Arizona" (*Bull.* Geol. Soc. America, vol. 41, pp. 293-313, 1930) describes a small but instructive mountain range of the fault-block type. The first part of the paper gives a short review of available knowledge concerning Basin-Range structure. Davis believes it "highly appropriate that the lava sheets, which were thus spread unconformably on the Powell surface of the worn-down King Mountains, and which now cover the back slopes of the tilted Gilbert blocks, should be called Louderbacks, after their discoverer, thus adding a fourth term to the simplified description of the Basin-Ranges." The Peacock Range, although the granite core is deeply eroded, preserves several little "Louderbacks" on its back-slope spur ends. The lava remnants demonstrate clearly the fault-block origin of the range. In another paper, "The Galiuro Mountains, Arizona," W. M. Davis and B. Brooks (*Am. Jour. Sci.*, vol. 19, 5th series, pp 89-115, 1930) describe another fault-block range.

Coast Range Structure.—In the "Structure of the San Gabriel Mountains, north of Los Angeles, California," Mason L. Hill (Univ. of Calif. Publications, *Bull.* of the Dept. of Geol. Sciences, vol. 19, pp. 137-170, 1930) shows that the faults of this range, formerly believed to be of the normal type, are actually thrusts. The overthrusting has been from the north toward the south.

AGE OF THE EARTH

The determination of the age of radioactive minerals is much more complicated than was formerly supposed. The equations ordinarily used do not consider the atomic weight of the lead, the amount of common lead present, or the presence of actinium lead. A new equation which considers all these factors, is given by A. F. Kovarik in a paper entitled "Basis for Computing the Age of a Radioactive Mineral from the Lead Content" (*Am. Jour. Sci.*, vol. 20, 5th series, pp. 81-100, 1930; also *Am. Jour. Sci.*, vol. 20, 5th series, p. 393). According to Prof. Kovarik's equation the thorite at Brevig, Norway, is 225,000,000 years old; the uraninite at Keystone, North Dakota, 1,454,000,000 years old; and a uraninite from Singaya, Carelia, is 1,853,000,000 years old.

DYNAMICAL GEOLOGY

Erosion Processes in an Arid Climate.—During the last few years William M. Davis has been studying the physiography of regions subject to arid climates. In the past year he has published two important papers dealing with the contrast in land forms developed in arid and in humid regions. One is entitled "Rock Floors in Arid and in Humid Climates" (*Jour. Geol.*, vol. 38, pp. 1-27 and pp. 136-158, 1930) and "Physiographic

Contrasts, East and West" (*Scientific Monthly*, May and June, 1930, pp. 394-415, and pp. 500-519). The writer sketches the sequences of forms for both regions in a cycle of erosion. He concludes that a close analogy exists between the two sequences and that the differences in appearance are of minor importance. Another recent paper containing a great deal of data relative to the geology and physiography of arid regions is by O. G. Thompson, "The Mohave Desert Region, California: a Geographic, Geologic, and Hydrologic Reconnaissance" (U. S. Geol. Survey, *Water-Supply Paper*, p. 578, 1929).

SEDIMENTATION

An important contribution to the subject of sedimentation has been made by W. W. Rubey in "Lithologic Studies of Fine-Grained Upper Cretaceous Sedimentary Rocks of the Black Hills Region" (Prof. Paper 165A, pp. 1-54, U. S. Geol. Survey). An unusually careful quantitative study has been made. The writer believes that the fissility of the shales is a secondary structure, for fissil shales are more abundant in stratigraphically lower beds and a slight discordance between bedding and fissility was frequently noted. More or less distinct laminations in the shale may represent annual layers. The shales accumulated slowly in rather deep water and the sandier rocks and calcareous marls more rapidly in shallower water. The fine-grained non-calcareous shales accumulated more slowly and in deeper water than the calcareous, organic, and pyritic rocks.

FIELD METHODS

For a number of years geologists have effectively utilized the airplane for rapid reconnaissance work and for obtaining photographs illustrative of regional structure and physiography. The latter phase of the subject is discussed in a paper by W. A. English, "Use of Airplane Photographs in Geologic Mapping" (*Bull.* American Association of Petroleum Geologists, vol. 14, pp. 1049-1058, 1930).

EARTHQUAKES AND VOLCANOES

BY L. DON LEET

SEISMOLOGIST IN CHARGE, HARVARD SEISMOGRAPH STATION

EARTHQUAKES

General.—Some property damage but no loss of life was caused by earthquakes in North America during 1930. As usual, California experienced the greatest number of shocks. Mt. Lassen, the only active volcano within the continental limits of the United States, occasioned some concern in nearby regions as a result of several earthquakes of the type which often presage an eruption.

Northeast Region. — Comparative stability in this region has followed the activity of 1929, which reached a climax in the severe quake of Nov. 18, 1929, off the Great Bank of Newfoundland. Minor shocks were reported on Feb. 12 at 1:15 A.M. from Franklin, N. H.; Feb. 19, Ottawa, Can.; March 11 at 6:30 P.M., Topsham, Me. (near Portland); March 27 at 2:30 P.M., West Springfield, Mass.; July 31 at 9:00 P.M., New Bedford, Mass.; Nov. 1 at 9:40 P.M., Malone, N. Y.

Eastern Region.—Only two shocks were reported from this part of the country during the year. Charlottesville, Va., reported tremors at 9:56 P.M., Dec. 25, 1929; and Fort Meyers, Fla., was slightly shaken on July 19.

Mid-West.—Oklahoma City, Union City, and El Reno, Okla., were shaken at 6:45 P.M., Dec. 27, 1929. Only one other quake of moderate extent previous to this (Sept. 10, 1918) is known to have occurred in this region since it was settled. April 2, a slight shock at 3:30 A.M. was reported from Caruthersville, Mo.; at 3:55 P.M. June 26 from Lima, O.

(curiously, Lima, Peru, reported a severe quake the same day); and at 6:15 P.M., July 10, from Marion, O. What is believed to be the first quake in the history of New Orleans occurred there on Oct. 20.

Western Mountain Region.—At noon March 23, a minor shock was felt in Albuquerque, N. M.; other slight earthquakes were reported from Perrydale, Ore. (15 miles northwest of Salem), on July 8; and four tremors occurred within three days, from July 13 to 16, at Three Forks, Mont.

Pacific Coast.—From Nov. 26, midnight, to the 28th, 1929, Hollister, Santa Margarita, and Mendota, Calif., and the surrounding territory were shaken by a series of quakes. Nov. 29, a landslide on Mount Whitney either caused by, or causing an earthquake recorded at Reno, Nev., was witnessed by passengers in an airplane. As the plane glided a few hundred feet above the peak, "an immense ravine on the mountainside gave way with a roar, sending up a great cloud of dust which nearly enveloped the ship." Dec. 1 and 8 at Aberdeen, 2nd at Jamal, and 3d at Chino, Calif., small quakes were felt.

Jan. 15, at 4:24 and 4:34 P.M. the country for 150 miles around the center of the San Bernardino Mountains was severely shaken. These shocks were followed by smaller ones, of which 47 were reported before midnight, and which continued for over three weeks. Jan. 22 at 8:25 P.M. and Feb. 11 at 1:20 P.M. central California, including Oakland, San Francisco, and nearby cities, reported shocks. Nearly 40 quakes—the greatest number recorded there at one time in more than a decade—rocked the actively seismic regions of the Imperial Valley, Southern California, between 3:30 P.M. Tuesday, Feb. 24, and 9:15 A.M. Wednesday, Feb. 25. Buildings were damaged, but there was no loss of life On Feb. 28, the region for approximately 100 miles northeast and southwest of Westmoreland, Cal., was shaken at 6:30 P.M. by a quake of minor destructive intensity. Its origin was considered to have been on the San Jacinto fault (Southern California). There were several strong fore-shocks, and hundreds of after-shocks. Damage reported amounted to about a thousand dollars. March 1, Brawley, California, and surrounding parts of the Imperial Valley were again disturbed, this time by six severe shocks and many minor ones, beginning at 3:44 P.M. Damage amounting to $100,000 was reported. Shocks continued through the next day. Minor shocks were reported as follows: March 6, Woodcrest, Calif.; March 19, Big Pine, Calif., a shock at 6:01 P.M. preceded at 5:50 by rumbling; April. 9, central and eastern Calif.; W. Nevada, at 1:58 P.M.; April 12, the same region at 4:30 A.M.; July 12, Sand Canyon, Calif.; Aug. 5, Ventura, Calif., two quakes—the first at about 3:30 A.M.; Aug. 30, Los Angeles was rather severely shaken at 4:39 P.M.; Sept. 2, San Luis Obispo, Calif, at 5:30 A.M.

Research.—Supported by funds from an anonymous donor, supplemented by a gift from the National Academy of Sciences, research is being conducted at Stanford University, in the School of Engineering, for the purpose of studying the action of engineering structures, particularly buildings, during an earthquake. The study of this subject is in its infancy, and is an important step toward the practical solution of construction problems in seismic areas. A preliminary report on this work appears in the *Bulletin* of the Seismological Society of America for September, 1930.

VOLCANOES

Mount Lassen, the only active volcano within the continental limits of the United States, was the center of many small quakes on Nov. 19, 1929. Again, Oct. 30, 1930, four quakes were reported from Redding, Calif., about 50 miles from the volcano. Similar disturbances in 1915 preceded an eruption from the crater. Observers constantly watching the pulse of Kilauea, Hawaii, reported two strong earth shocks May 20 and 21, and another May 25. Kilauea resumed activity on a small scale Nov. 20.

Mount Katmai, the scene in 1912 of one of the great eruptions of modern times, together with Mageik, Pavlof, Kagamil, Alcutan, Chiginagak, and Shishaldin, were reported as erupting violently during the week preceding Dec. 17, 1929, on which date a severe earthquake occurred in the region. Following the great explosion in 1912, these same peaks were active in 1913, 1914, 1926, and 1927.

BIBLIOGRAPHY

Bibliography of Seismology, by Ernest H. Hodgson, published quarterly by the Dominion Observatory, Ottawa, Canada.

Bulletin of the Seismological Society of America, published quarterly at Stanford University, California.

Earthquake Notes, issued quarterly by the Eastern Section of the Seismological Society of America, R. R. Bodle, Editor, U. S. Coast and Geodetic Survey, Washington, D. C.

MINERALOGY AND PETROGRAPHY

By Herbert P. Whitlock

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New Species of Clay Minerals.—Reviewing the year 1930 in relation to definite accomplishment in mineralogy two notable contributions to science stand out in definite contrast, the one with the other. As a result of an investigation into the identity and character of the kaolin group of clay minerals, carried on during several years in the laboratories of the U. S. Geological Survey, the U. S. National Museum, and Columbia University by Dr. Clarence S. Ross and Prof. Paul F. Kerr (*Amer. Mineralogist*, vol. XV, p. 34) the authors have succeeded in eliminating from this much burdened section of the hydrous silicates many species which they have shown to be mixtures of three kaolin minerals, kaolinite, macrite and a new member of the group, for which they propose the name *dickite*, in honor of Dr. Allen B. Dick, who first (1888) drew attention to its occurrence.

In sharp distinction to the above research, which has achieved the elimination of a number of names from the accredited species of the clay minerals, is the series of studies carried on for the last seven years by Prof. Esper S. Larsen of Harvard University, and Dr. Earl V. Shannon of the U. S. National Museum. This investigation (*Amer. Mineralogist*, vol. XV, p. 303) deals with the separation and identification of a number of new mineral species present in concretionary crusts and druses in the phosphate nodules from near Fairfield, Utah. The intimately intergrown character of these concretionary deposits rendered this study both close and intricate and in most instances the optical properties constitute the determinative criteria. The *wardite* of this occurrence was shown to be identical with *Soumansite* from Montebras, Creuse, France. The new species are hydrous phosphates of lime, soda-potash and alumina in varying combinations and proportions and have been named as follows: (1) *Deltaite*, from a characteristic Greek letter (Δ) cross section; (2) *Dennisonite*, after Mr. J. M. Dennison; (3) *Dehrnite*, from Dehrn, Nassau, Germany, where the species also occurs; (4) *Lewistonite*, from Lewiston, Utah; (5) *Englishite*, after George L. English; (6) *Millisite*, after F. T. Millis; (7) *Lehiite*, from Lehi, near Fairfield, Utah; (8) *Gordonite*, after Mr. S. L. Gordon.

Probertite.—In addition to the above, a number of new mineral species from various localities have been announced during the year. Of these the most commercially important, the lime-soda hydrated borate, from the Kramer district, Kern Co., California, is named *probertite* in honor of Prof. Frank H. Probert, Dean of the Mining College of University of California. Probertite occurs in radiating colorless monoclinic crystals and in embedded rosettes. A more recent description assigns the name *kramersite* to this borate, the first mentioned name, however, seems to have precedence.

Fersmanite.—A new titano-silicate of lime and soda from the Kola Peninsula, Russia, has been named *fersmanite* in honor of Prof. A. E. Fersmann. The crystals of this mineral resemble those of titanite.

Lessingite. — Also from Russia comes a new silicate of calcium and the rare earths which occurs in greenish to reddish yellow rolled pebbles in an affluent of the Borzovka River, near Kychtym, Urals. The name *lessingite* has been given to this new silicate in honor of Prof F. Loewinson Lessing, a Russian petrologist.

Klebelsbergite.—The mines of Roumania and Hungary have furnished two new mineral species. A basic hydrous sulphate of antimony occurring as yellow powdery crystals on stibnite from Felsöbánya, Hungary. In honor of Dr. Kuno Klebelsberg, the name *klebelsbergite* has been given to this mineral.

Fülöppite.—A new lead sulph-antimonide of the plagionite semseyite group has been named *Fülöppite,* in honor of Bèla Fülopp, a Hungarian mineral collector. It occurs in bright, metallic, steel-blue monoclinic crystals at Nagybánya, Szatmar, Roumania.

Bismutotantalite.—Recent mining development in Africa has brought to light two new mineral species. *Bismutotantalite,* a new tantalate of bismuth analogous with stibiotantalite, occurs in pitch-black orthorhombic crystals having a sub-metallic luster, at Gamba Hill, in the Kampala section of Uganda.

Arandisite.—A new tin mineral has been found near Arandis, South West Africa, and named *arandisite.* It is a basic silicate of tin occurring in apple-green, resinous fibrous masses.

Zamboninite.—A new lime-magnesia fluoride from Monto Rossi, Etna, Sicily, has been named *Zamboninite* in honor of Prof. F. Zambonini. This mineral occurs in gray mamillary masses and white radiating fibers in an old fumarole channel.

Scawtite.—A new silicate and carbonate of calcium, from Scawt Hill, in County Antrim, Ireland, has been named *scawtite* from the locality. It is found in clusters of flattened, colorless plates and is probably monoclinic in crystallization.

TERRESTRIAL MAGNETISM

By Daniel L. Hazard

United States Coast and Geodetic Survey

MAGNETIC SURVEYS

Loss of the Carnegie.—The seventh cruise of the yacht *Carnegie* of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington was brought to a tragic end at Apia, Samoa, Nov. 29, 1929, when an explosion while taking on a supply of gasoline resulted in the total destruction of the vessel and her equipment and the death of Capt. James Percy Ault and Cabin Boy Anthony Kolar. Fortunately the records of observations made up to that time had been sent to Washington, but the excellent results obtained not only in the field of terrestrial magnetism and electricity but in many other branches of oceanographic work, serve to emphasize the magnitude of the disaster which prevented the completion of the cruise just at the time when most of the troubles which are bound to develop in pioneer work had been overcome. The *Carnegie* had sailed over 250,000 miles and visited all oceans. Capt. Ault had been in command of the *Carnegie* during the last fifteen years of her activity, and the success of her later cruises has been due in large measure to his executive ability and thorough knowledge of the fundamentals of the many fields covered by the observing program.

Land observations of the Carnegie Institution were confined to coöperative work with the University of Cape Town in South Africa, with the British East Africa Meteorological Service, and with the Adelaide Observatory, South Australia. During the year the Coast and Geodetic Survey made observations at repeat stations in the western part of the country to complete the data regarding the change of the earth's magnetism since 1925 needed to prepare a magnetic declination chart of the United States for 1930. Observations were made also in Alaska and the Philippine Islands.

MAGNETIC OBSERVATORIES

Magnetic Observatories are maintained by the Coast and Geodetic Survey at San Juan, P. R.; Cheltenham, Md.; Tucson, Ariz.; Sitka, Alaska; and near Honolulu, Hawaii; by Canada at Agincourt, near Toronto, and at Meanook, Alberta; by Mexico at Teoloyucan, near Mexico City; by the Carnegie Institution at Watheroo, West Australia, and at Huancayo, Peru. The Carnegie Institution also coöperates with New Zealand in the maintenance of the magnetic observatory at Apia, Samoa. With its coöperation, continuous records of conductivity and potential gradient now form a regular part of the output of the Tucson observatory.

INVESTIGATIONS

Variations of the Earth's Magnetism.—The results secured by the *Carnegie* at stations close to the tracks of former voyages of the *Carnegie* and *Galilee* combined with the results at repeat stations on land have made possible a broader study of the secular change of the earth's magnetism and emphasized the complexity of the phenomenon. The rates of change vary not only from place to place but from decade to decade and there is little evidence of the systematic development which might be expected with a single source of energy. A detailed study of an abruptly beginning magnetic storm as recorded at 25 widely separated observatories showed that while the storm began almost simultaneously at all the observatories the amplitude and direction of motion at any moment was controlled at least in part by local conditions.

Radio Transmission.—The study of the reception of radio waves of various lengths and its relation to varying electrical conditions of the upper atmosphere and to changes in the earth's magnetic field is gradually being systematized, but there are so many factors involved that years of careful observations will be required to insure definite conclusions. The varying height of the Kennelly-Heaviside layer, which plays such an important part in long distance radio transmission, has been given much attention; even at Little America means were found for making measurements of its height at different times.

COSMIC BROADCAST

With so many investigations in progress involving possible correlations with the magnetic and electrical conditions of the earth and sun, it became important to have prompt information regarding these conditions. Accordingly the American Section of the International Scientific Radio Union, with the coöperation of Science Service, has arranged for a daily "cosmic broadcast" which has been in successful operation since Aug. 1. The message (in code) at present gives the magnetic character of the preceding day, the number of visible sun spots and the solar constant of radiation. Other features will be added as the need develops. An unexpected use of this broadcast has come to light in connection with the testing of certain electrical instruments so sensitive as to be rendered unreliable during the occurrence of a magnetic storm.

INTERNATIONAL POLAR YEAR

Good progress is being made in preparing for a systematic study of magnetic and meteorological conditions in the polar regions during the year

1932-33, in which many nations are to take part. A number of European countries have indicated their intention of maintaining observing stations and have already begun the preparation of equipment and the training of observers. It is hoped that nearly all of the stations occupied in 1882-3 will be reoccupied and that there will be a number of new stations in the Arctic as well as some in the Antarctic. The United States is expected to provide for magnetic observations at Fairbanks, Alaska, where auroral observations are already in progress under a grant by the Rockefeller Foundation.

MISCELLANEOUS

Personnel.—Dr. Louis A. Bauer, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington since its establishment in 1904, retired from that position because of ill health on Jan. 1, 1930, with the title of Director Emeritus. He was succeeded by John A. Fleming as Acting Director. Mr. Fleming was Dr. Bauer's chief assistant from the beginning. At the meeting of the International Union of Geodesy and Geophysics held at Stockholm in August, 1930, Mr. Fleming was elected President of the Association of Terrestrial Magnetism and Electricity. Many important matters were considered and a number of committees were appointed to study specific problems.

Publications.—Among recent publications of the Coast and Geodetic Survey are *United States Magnetic Tables and Magnetic Charts for 1925; Directions for Magnetic Measurements*, third edition; *Magnetic Declination in Delaware, Maryland, Virginia, West Virginia, Tennessee and Kentucky; Magnetic Declination in the Philippine Islands in 1925.* The annual report of the Carnegie Institution contains a detailed statement of the work of its Department of Terrestrial Magnetism.

The Journal, *Terrestrial Magnetism and Atmospheric Electricity* continues to hold an important place as evidenced by a 50 per cent increase in the size of the volume since 1927.

METEOROLOGY AND CLIMATOLOGY

By Burton M. Varney
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AEROLOGY

Weather Reports.—The increasing usefulness to aviation shown by extension and intensification of weather reports for airways, noted in this section for 1929, has led to gratifying financial support of these activities by Congress. The Department of Agriculture appropriation bill carried substantial increases for the U. S. Weather Bureau, a generous share of the increase for further development of the airways reporting service. It is intended to provide the Seattle-San Francisco airway and the Chicago-Brownsville airway with a system of 3-hour reports and the Boston-Jacksonville airway with one giving reports every 6 hours. On some of the flying routes where especially in winter the weather changes are rapid and frequent, provision for frequent radio broadcasts of observations during critical weather has been proposed. Frequent weather news is now supplied for some 13,000 miles of airway. Hourly teletype exchange of reports is in force on about 8,000 miles. About 110 stations report every three hours to 7 forecast centers from which by teletype to airports and landing fields are sent bulletins and short-period forecasts. The Department of Commerce is coöperating through a rapidly expanding net of radio stations which broadcast this material to planes in flight,

Radio Signal Transmitter.—Use of "pilot balloons" for tracing the direction and velocity of atmospheric currents is well known. The method has hitherto been under the serious disability of not furnishing information during darkness, clouds, fog or dense haze. Observations have thus been least possible when most needed. The Meteorological Division of the U. S. Signal Corps has developed a tiny automatic radio transmitter capable of being supported by 3 pilot balloons. These rise at a known rate, the radio apparatus meanwhile sending out continuous signals whose bearing from the observing station is determined by a radio direction finder. Bearing and altitude are thus plotted at intervals of one minute, the directions and velocities of the wind at the balloons being so obtained. We may now expect information about the upper air regardless of weather or time of day.

Storm Observations.—The problem of cyclonic storms is being attacked in one of the two stormiest corners of the United States. A plane from the Naval Air Station at Seattle, equipped with a meteorograph, makes a daily flight (except Sundays) whenever possible. The maximum altitudes reached vary from some 12,000 to 20,000 feet. Observations include pressure, temperature, humidity, visibility; kinds of clouds and direction of movement at the take-off; heights of cloud bases, and of tops whenever these can be reached; conditions of the air as regards bumpiness. While the major objective is practical service to aviation, the possibilities of obtaining scientific data for the study of storms are enormous. This method should add materially to that current information which is so vitally necessary to an understanding of the evolution of the individual storm. Here again we need information most when it is hardest to obtain. However, increase in "instrument flying" when visibility is nearly or quite *nil* will make observation flights in bad weather increasingly feasible.

Aero Expeditions and Stations.—Results of the aerological program carried out by the first three University of Michigan Greenland Expeditions to July 21, 1929, under direction of Prof. W. H. Hobbs, went to the printer, under the editorship of S. P. Fergusson of the U. S. Weather Bureau, late in 1930. It will soon appear as Aerological Volume No. 1 of the expedition. A fourth expedition is in the field for 1930-31. The former station at Mt. Evans, in 67° N. lat., having been closed in July, 1929, the expedition this year is divided. William Carlson is observing in lat. 72°50′ near Upernivik and but two miles from the ice cap; Evans Schmeling is at Ivigtut in lat. 61° in extreme southern Greenland. Financial support of the Carnegie Institution of Washington, the Pennsylvania Salt Co. and the Cryolite Mining Co. assures operation of these stations for a year. The U. S. Weather Bureau has furnished instrumental equipment. Coöperation with seven other stations recently set up in Greenland by English and European scientists, is an essential part of the program. Stimulating of international meteorological research in the Arctic by the example of the University of Michigan Expedition has special significance at this time, since this research will form an important preliminary to the "International Polar Year" of 1932-33 in which meteorologists from the United States will coöperate with those of other nations in a concerted observational attack upon polar weather.

AMERICAN METEOROLOGICAL SOCIETY

Annual Meeting.—The annual meeting in December, 1929, marking the tenth birthday of the Society, was held in Des Moines. There were presented many papers occupied with agricultural climatology and aeronautical meteorology. One session concerned the splendid work of the Coöperative Observers of the U. S. Weather Bureau; one group of papers dealt with the history of meteorology in this country. President Humphrey's second presidential address on "The Structure of the Atmosphere" appropriately supplemented the group of papers on aeronautical meteorology. Among these, W. L. Smith discussed the importance of meteorology from the operations standpoint; V. E. Jakl and W. C. Devereaux dealt with the influence of fogs and low clouds on aviation, Mr. Devereaux suggesting that where practicable the flying schedules should recognize the two most important hazards; namely, early morning fogs and the violent turbulence characteristic of mid-afternoons in thunder-stormy regions. T. A. Blair presented results of an investigation indicating that certain typical distributions of atmospheric pressure over the northern hemisphere in summer and in autumn precede cold or warm winters over the northern Mississippi Valley as these distributions vary in certain ways, the correlations being unusually high.

Studies of Gulf Stream.—Dr. C. F. Brooks reported on his investigations of Gulf Stream temperatures (noted in this section for 1929). For four years the Stream has been studied by continuously recording sea-water thermographs. Highly complex water temperature conditions have been revealed. In sunny, quiet weather the surface temperatures between Key West and Havana show a daily range of 3° to 4° F. and at one fathom depth some 2°. Wind reduces the surface range to 1° or less. In summer the northern part of the Stream is usually warmer than the southern part; in winter the south is usually warmer than the north. Between the two is a zone of water several degrees cooler than that on either the north or south and the position of this intermediate zone often changes many miles in a few hours, due to wind and other influences that bring now more Caribbean water and now more Gulf water into the Stream. Storms reduce the surface temperatures one or more degrees. Strong cold winds such as sometimes blow in winter greatly reduce the temperature (the lowest recorded being 58.5° F. and the highest 87.5° F.). "Further studies of the Gulf Stream in so far as it has meteorological significance will embrace some computation of the current, and of the heat carried, to facilitate discovery of any progress of sea temperature departures northeastward in the Gulf Stream. Comparisons of variations of recorded Gulf Stream temperatures from year to year with seasonal weather abnormalities in the eastern portion of North America will also be made, to the end that both the effects of the weather on the Gulf Stream and of the Gulf Stream on the weather may become known."

Rainfall Test.—Dr. Dinsmore Alter is now carrying out his fifth year of test half-year rainfall predictions in the British Isles. The agreements between predicted and observed rainfalls have been excellent. For 1929 "they called for an unusual drought for the first half year, and that which occurred actually exceeded the predictions. For the second half year they call for almost exactly the normal rainfall and at the end of November this seems to be the correct result." Dr. Alter is expanding the investigation on the basis of 203 years of record (91 years were used in the previous study) and he will attempt predictions for quarter years.

Discussion at Spring Session.—At the Spring meeting of the Society in Washington, Prof. C. F. Marvin discussed the measurement of gustiness and the interpretation of anemometer records. Dr. H. H. Kimball discussed the factors entering into the disposal of various wave lengths of solar energy after it reaches the earth's atmosphere; he also presented a second large group of solar radiation data from many parts of the world (*Mo. Wea. Rev.*, Feb.). Among the numerous other papers were one on the Alpine afterglow, effects of winds from the Atlantic on temperatures in the eastern United States, cyclones of chinook origin, observations on the eye of the tropical cyclone, Gulf Stream thermograms from the Straits of Florida. One of the most significant advances in agricultural meteorology in recent times was reported on by Mr. Kincer of the Weather Bureau. His work during the past few years on the relations between weather, boll weevil and cotton yield has led to the development of mathematical methods for correlating yield with the influencing factors, whereby an accuracy of 97 per cent for the years since 1909 has been obtained. This extraordinary success should lead to great benefits for all concerned, since it is now possible to forecast yields far in advance of the harvest.

Western Meeting.—Western members of the Society met in June at the University of Oregon. Most of the papers dealt with various phases of two subjects: upper air investigations, in part as they concern aviation; forest fires and the weather. Mr. Ellison described some experiments with an automatic psychrometer. Prof. Douglass discussed recent studies in weather cycles. Prof. Mead Adams of the University of California at Los Angeles, who has performed the remarkable feat of growing snow crystals directly from water vapor under the microscope, described some results of his work.

RESEARCH

Lightning.—Of the many important investigations carried forward during the year (in addition to those noted) it is possible to mention only a few. (See *Monthly Weather Review* and the *Bulletin of the American Meteorological Society.*) Dr. J. C. Jensen of Nebraska Wesleyan university has continued his studies in the electrical charges of thunderstorms. Testing Simpson's conclusion (1926) that a lightning flash originates only in the region of maximum positive electrical field and his suggestion that it is necessary to know what part of a thunderstorm is overhead when change of field is being recorded, Jensen has secured photographic records which indicate "that in the active front of the cloud most of the discharges to ground are forked downward . . . . and that in the secondary part, the other type with branches upward, predominates."

Tropical Storms.—Dr. S. S. Visher of the University of Indiana has published some further results of his long study of tropical storms. He concludes that these storms are of far greater importance to tropical climate, through their influence upon rainfall, than has hitherto been recognized. Their effects in benefiting agriculture in regions far removed from the destructive storm center, he believes greatly outweighs the devastation. The destruction storms, moreover, form but a comparatively small fraction of all tropical revolving storms. In most regions, only a fifth or a sixth of all storms are destructive, the extremes being in the Arabian sea, a third, and in the Bay of Bengal, only about a tenth.

Alaska Climates.—A study by Miss E. M. Fitton of Clark University on the climates of Alaska goes much more thoroughly into details than previous studies. It considers four climatic provinces under the headings of sunshine, cloudiness and fog, temperature, length of the frostless season, winds and pressure, precipitation, snowfall.

Evaporation.—In the very difficult problem of evaporation measurement, N. W. Cummings of the Scrips Institution of Oceanography of the University of California has developed an alignment diagram for rapidly determining the values of the ratio of sensible heat swept away from a water surface by convection (wind) to the latent heat carried off by the water vapor. In considering certain limitations of the possible values of this ratio, he concludes that the average evaporation from an area is never less than 42 per cent nor more than 100 per cent of the evaporating power exerted by the excess of incoming over outgoing radiation, and further that there is a very small probability of the evaporation ever reaching either of these extreme rates.

Crop Temperatures.—Refinements of methods in predicting minimum temperatures for protection against frost is the object of a study by Mr. Ellison of the Weather Bureau, in which he develops formulae and graphic representations for use in the practical field work of guarding crops against injury by cold.

Rain Precipitation.—The search for reliable methods of forecasting seasonal precipitations over California continues to be an important contribution by the Scripps Institution of Oceanography. Dr. A. F. Gorton, carrying forward the pioneer work of McEwen in that field, is making an exhaustive study of various indices of the seasonal rainfall, correlating them with air temperatures, ocean water temperatures, atmospheric pressure, etc., on the east and west shores of the Pacific. His tentative conclusions are as follows: "As to forecasting indices applicable to the seasonal precipitation, it would seem that the ocean temperatures taken during the summer at inshore points between Cape Mendocino and San Diego furnish on the whole a more reliable basis than observations of water temperatures or weather elements at much more distant points. The index with the highest coefficient at present is that based on a combination of surface temperatures a the inshore stations, Hueneme an La Jolla, and the ratio of probabl error to the coefficient (0.06 to 0.84) is small enough to justify consider able faith in the reliability of th index. The most obvious criticis is that it rests upon such a limite observational basis. However, if ou investigations reveal one or more ad ditional factors related to subsequen seasonal rainfall, and all are com bined as was done in developing th Indian forecasting systems, th chances are that the resultant corre lation coefficient will be greater tha that for the present index."

CARTOGRAPHY

By W. L. G. Joerg

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MAPS ON THE SCALE OF 1:1,000,000

International Map of the World.—The continued and regular appearance of sheets of this map might lead to its being considered a routine undertaking not calling for repeated comment. However, this would be to overlook its fundamental importance, which consists of providing maps of all parts of the world on the same scale and with the relief of the land represented in the same way. This makes it possible to compare one area directly with any other and to gain that true picture of the relation of different parts of the world which the greater emphasis placed on some countries in our atlases generally tends to distort. Far from being of a routine nature, many sheets, as was here pointed out with regard to the Hudson River sheet (American Year Book, 1927, p. 610), represent the first really adequate general maps to appear of these areas.

Among the 22 new sheets issued since the last review of this undertaking (American Year Book, 1928, p. 669) this is especially true of the sheets South J-55 (Melbourne), which admirably represents the Eastern Highlands northeast of the second largest city of Australia, and North L-18 (Montreal), which bring out the St. Lawrence Lowland an surrounding uplands in northern Nev York and Vermont (north of 44°N. and adjacent Quebec and Ontario. Th Montreal sheet published by the Ca nadian Department of the Interior i somewhat bolder in treatment tha the Hudson River sheet, published b the U. S. Geological Survey, which i adjoins on the north, and hence suc natural features as the Adirondack and the Green Mountains do not quit receive uniform representatio throughout.

The other new sheets are: in Eu rope, Q-35 (Oulu), 0-34 (Stockholm) M-32 (München; French portion a ready issued under title Strasbourg) M-34 (Kraków), M-35 (Lwów), L-3 (Milano), L-33 (Trieste), K-3 (Firenze) K-33 (Roma), J-33 (Pa lermo), K-29 (Porto), K-30 (Madrid French portion already issued unde title Pau), J-30 (Valencia); i Africa, North H-28 (Las Palmas) North H-36 (Cairo; two edition one with usual altitude tints, the oth er differentiating between "the deser [in brown] and the sown [in green] South F-33 (Windhoek); in Asi H-41 (Sistan), H-42 (Sulaima Mountains), N-44 (Allahabad), E-4

(Irrawaddy). Of these, sheets H-41 and H-42, by the Survey of India, owing to neglect of the contrast between brown tints in the upper altitudes called for by the international regulations, lack that plastic effect which the same organization has been able to impart to the sheets (Nos. 30, 34, 39) of an equivalent series that it also publishes (Map of India and Adjacent Countries, 1:1,000,000).

Other Equivalent Series.—The International Map of the World is an international undertaking in which each country is responsible for the production of the sheets within which its home territory and its colonial dependencies, if any, are comprised. But in view of the fact that some countries are not likely to participate for years to come, a number of private and governmental institutions have undertaken to produce the equivalent of this series of certain parts of the world outside of their national domain. There are four such series which in the two fundamental essentials of scale and of representation of relief by means of altitude tints correspond, except for minor variations, to the International Map. These are: (1) the Map of Europe and the Near East, originally compiled as a war measure by the Royal Geographical Society of London and the Ordnance Survey, and subsequently by the Geographical Section of the General Staff of the British War Office; (2) the Map of India and Adjacent Countries, published by the Survey of India, Calcutta; (3) the Map of Brazil published by the Engineering Club of Rio de Janeiro (see AMERICAN YEAR BOOK, 1925, p. 878; (4) the Map of Latin America being published by the American Geographical Society of New York (*ibid.*, 1928, p. 669). These four series, together with the International Map itself, now cover practically all of Europe west of Russia, most of the Near East, India, and Farther India and almost all of South America, with sporadic sheets in the other parts of Asia, in Africa, Australia, and North America. This is a remarkable achievement when it is recalled that the first sheets were issued only in 1911 and 1912.

UNITED STATES—CANADA BOUNDARY SURVEYS

The detailed topographic maps of the boundaries between Canadian and United States territory as definitely laid down in the Conventions of Jan. 24, 1903, and April 21, 1906, and the Treaty of April 11, 1908, have now practically all been published (International Boundary Commission, Washington, D. C.). There are six series: (1) 141st meridian boundary of Alaska, 38 sheets on the scale of 1: 62,500; (2) "Panhandle" boundary of Alaska, 13 sheets in 1:250,000; (3) the 49th parallel boundary, 59 sheets in 1:62,500; (4) Lake of the Woods to Lake Superior, 36 sheets in 1:24,000 and 1:6,000; (5) from the St. Lawrence to the source of the St. Croix River, 61 sheets in 1:24,000, 1:12,000 and 1:6,000; (6) from the source of the St. Croix to the Atlantic Ocean, 18 sheets in 1:24,000, 1:12,000, 1:6,000.

CANADIAN MAPS

Three maps each illustrating a different aspect of the geography of Canada as a whole have recently appeared, all published by the National Resources Intelligence Service (now the National Development Bureau) at Ottawa: physical map, showing relief in altitude tints, scale 1:3,801,600, 1928; a vegetation and forest cover map in 1:6,336,000, 1930; and a population map based on the census of 1921, 1:4,100,000, 1927.

POLAR MAPS

In continuation of its policy of polar research (see AMERICAN YEAR BOOK, 1928, p. 670) the American Geographical Society of New York has published three further maps: a map of the Antarctic showing its relation to the southern continents, 1:12,500,000, 1929; a physical map of the Arctic and a bathymetric map of the Antarctic, both on the scale of 1:20,000,000, 1930. The second shows the relief of Arctic lands in altitude tints and hachures, the third represents the major features of the submarine relief of the southernmost Atlantic, Indian, and Pacific Oceans by means of depth tints in blue and soundings. The two 1:20,000,000 maps accompany the Society's *Special Publication No. 11.* The discoveries of the Byrd expedition are shown on a map in 1:8,000,000 accompanying Admiral Byrd's book *Little America* (1930); those of the Mawson and *Norvegia* (Riiser-Larsen) Antarctic expeditions of 1929-30 on two maps in 1:25,000,000 (details in 1:6,000,000) in the October, 1930, *Geographical Review,* as Pls. 6 and 7 respectively.

AMERICAN EXPLORATION IN 1930

By Robert M. Brown

Professor, Rhode Island School of Education

BURNING OF THE "CARNEGIE"

The work and movements of the Carnegie Institution's non-magnetic ship *Carnegie* were reported in the 1929 American Year Book. The *Carnegie* was burned as the result of a gasoline explosion in the harbor at Apia, Samoa, Nov. 30, 1929. Capt. J. P. Ault was killed. The policy of mailing back records at all ports of call prevented the loss of the observations.

ANTARCTIC EXPLORATION

Sir Hubert Wilkins made a number of flights about the Belgica Sea area; Dec. 19, 1929 from Weddell Sea crossing the mainland of one of the large islands of the Graham Land group; Dec. 28 and again Dec. 29, in the Charcot Island region; Jan. 5, 1930, from Port Lockroy to Deception Island; Jan. 30 and Feb. 1, over the ice pack in longitude 100° W. Great difficulty was experienced in launching the sea planes because of the lack of open waters. New maps of the area following these explorations will show Hearst Land, probably the coast line of the Antarctic Continent for hundreds of miles; the outlines of Stefansson Strait between Hearst Land and the Archipelago; Charcot Land as an island and not a part of the main land and a large number of islands formerly mapped as a part of Graham Land. The sea plane left by Wilkins on his return from his previous expedition was found in good condition and used.

The Byrd Antarctic Expedition, 1928-1930, returned to Dunedin March 10, after two successful seasons of explorations. In preparation for the flight to the South Pole Nov. 18-20, 1929, a base-laying flight established a depot of gasoline, oil and food at the base of the mountains which bound the Polar plateau, about one-half the distance from Little America to the Pole, and Nov. 28-29, 1929, the flight to the Pole, covering a distance of about 1,600 miles in a flying time of little less than 18 hours, was successfully accomplished. The Ford tri-motor plane with Admiral Byrd, Bernt Balchen, pilot; Harold I. June, radio operator; and Captain Ashley C. McKinley, camera operator, had to be lightened by throwing over some of the load in order to mount to the plateau level; and on the return from the Pole a stop was made at the base of the mountains to refuel and to leave the excess supplies for the geological party which after a number of depot-laying trips, left Little America Nov. 4 and returned on Jan. 19, 1930. Other explorations include a second flight northeast of Little America, Dec. 5, 1929; an aerial survey of Discovery Inlet, Jan. 20, 1930; a flight over the interior of the Ross Shelf Ice, Jan. 21; and a flight along the Shelf Ice Front near the Bay of Whales, Jan. 26. In addition to the observation of much area not before seen both inland and along the borders of the Ross Sea many records of magnetic variations, air conditions, geologic observations and soundings were brought back. Sixteen hundred pictures were taken during the flights which are a permanent record of the area of exploration. Aerial surveys, a new feature of polar work, furnished ground parties with maps of the area to be traversed. The use of the radio was more extensive during this expedition than ever before not only by keeping the explorers in contact with current affairs of the world, but also in a constant touch with the base at Little America of all exploring parties. The flight to the South Pole was undertaken after a favorable report on the weather at the base and from the geologic party 440 miles to the south.

TRANS-ATLANTIC FLIGHTS

Coste and Bellonte.—A Paris to New York non-stop flight was accomplished during the year, when Capt. Dieudonné Coste and Maurice Bellonte landed their biplane *Question Mark* at Curtiss Airport, New York, Sept. 2, 37 hours and 18 minutes after leaving Le Bourget. This is the fifth successful crossing by heavier than air machines; the third and fourth occurring also during 1930. June 23, Capt. Charles Kingsford-Smith and three companions landed at Harbor Grace, Newfoundland, after a flight of 32 hours 30 minutes from Port Marnock, Ireland. The failure of the compass needle and the impossibility of getting bearings by radio while in a dense fog caused such a loss of time that a landing was necessary. Kingsford-Smith used the *Southern Cross* which in 1928 flew from San Francisco to Australia; and in 1928 from Australia to London. In August, Von Gronan and three companions crossed the Atlantic, Germany to New York, with stops at Faroe Islands, Iceland, Greenland, Labrador and Nova Scotia.

GREENLAND WEATHER STUDIES

University of Michigan.—The fourth expedition of the University of Michigan to conduct researches in meteorology on and about the Greenland ice cap is maintaining two stations. One party under William S. Carlson and located near Upernivik in northwest Greenland, is prepared for one year's stay in the field, and here studies in atmospheric circulation of the upper air with the aid of pilot balloons will be conducted and in addition glacial investigations will form another branch of this party's labors. The second party under Evans S. Schmeling will locate at Ivigtut in southern Greenland, 900 miles south of the northern party, and will carry on similar upper-air and glacial observation. Prof. William H. Hobbs, director of the expeditions, will remain this year in Ann Arbor.

The German Greenland Expedition, the second under the leadership of Alfred Wegener, has established three stations: one on the ice cap 250 miles from the coast, one at Scoresby Sound and one at Disko Bay.

English Expedition.—A group of English surveyors, airmen and meteorologists sailed on July 3 for Greenland with the purpose of remaining one year in order to study conditions for an air route from England to Canada. The expedition will establish a base camp on the southeastern coast of Greenland and a station on the ice cap. The route as laid out has no stretch of sea flying over 300 miles and for more than four-fifths of the way there are natural emergency landing grounds, and a system of gasoline dumps will be carefully organized. It is expected that experimental flights will be made next year. The leader is H. George Watkins.

Dumbrava Expedition.—A fourth expedition to observe the weather and air currents with the object of showing the feasibility of a safe route for transatlantic flying is established at Scoresby Sound under Dr. Constantin Dumbrava.

NATIONAL GEOGRAPHIC SOCIETY EXPEDITIONS

Alaska.—Dr. Robert F. Griggs, leader of six previous expeditions to the Mt. Katmai country in Alaska, where he studied processes and results of the eruption of Mt. Katmai in 1912 and discovered the Valley of Ten Thousand Smokes, led another expedition to the same area in 1930. His chief objective on this expedition was the study of the revegetation of the area after the entire obliteration of all living matter as a result of the eruption. As the outburst of Mt. Katmai had been without parallel in modern times and was a counterpart of the great volcanic outpourings of the geological past the rise of a new flora possesses many aspects of botanical and zoological interest. In previous expeditions Dr. Griggs had found plants in the process of recolonization in favored situations. But where there was nothing except nitrogen-free ash derived from the interior of the volcano vegetation had not succeeded in establishing itself. In the 1930 expedition Dr. Griggs found that leafy liverworts have succeeded in getting a foothold out on the pure, undisturbed ash. Where they have succeeded in establishing thick carpets the mosses are beginning to follow, and where mosses have gotten a foothold seedlings of willow, and other plants are beginning to appear. Before Dr. Griggs led his earliest expedition to Mt. Katmai, Dr. Frederick V. Coville, Chairman of the Research Committee of the Board of Trustees of the National Geographic Society, had stated that the blanket of pumice, exclusively of mineral origin, is "undoubtedly representative of vast areas that have existed in past ages in the geological history of the earth. A study of the means by which vegetation establishes itself under the adverse conditions presented by such a raw mineral soil will throw much light on the history of the earth and its preparation by plants for the habitation of animals and man." The 1930 expedition led by Dr. Griggs abundantly bears out the prediction of Dr. Coville. The expedition also served to disclose the fact that the Valley of Ten Thousand Smokes has gradually declined in the intensity of its activity.

South American Air Routes.—Frederick Simpich led an aerial expedition to South America for the purpose of making a geographical and photographic study of the air routes between the Americas. The other members of the expedition were Jacob Gayer, staff photographer; Capt. Albert W. Stevens, internationally known serial photographer, two pilots and two mechanicians. The expedition flew to Havana, then headed for Martinique, where a photographic study of the area devastated by Mont Pelee in the eruption of 1902 was made. The islands of the broad mouth of the Amazon were photographed in detail. A fine photographic study of a waterspout in action, with views of it from all sides and at various heights was made in the waters north of Cuba.

Brazil-Venezuela.—Dr. Ernest G. Holt, who has spent several years as the head of a Society expedition studying migratory bird life in the uplands of Venezuela, now is leading the National Geographic Society Brazilian-Venezuelan Expedition of 1930-31 and has begun his researches into the bird and animal life along the boundary between the two countries, with a base camp on a tributary of the Rio Negro, less than 100 miles north of the Equator. It is expected that the expedition will continue in the field for the next year.

FIELD MUSEUM OF NATURAL HISTORY

Asia.—The Field Museum of Natural History, Chicago, has had eleven expeditions in operation during the year; three in Africa, two in Asia, two in the South Pacific, two in the United States and one each in South America and Europe. Herbert Stevens of the William V. Kelley-Roosevelts Expedition to Eastern Asia of a previous year has returned, after traveling about 3,000 miles in the Chinese provinces of Yunnan and Szechuan and along the Tibetan border, with 20,000 specimens of mammals, birds, insects and plants in his collection. The other Asiatic expeditions include (1) the Suydam Cutting Expedition to Northern India for zoological collections and the Field Museum-Oxford University Joint Expedition to Mesopotamia (eighth season) which conducted archaeological excavations on the site of the ancient city of Kish.

Africa.—The African expeditions include (1) the Vernay-Long Kalahari to the Kalahari Desert and Bechuanaland for zoological collections; (2) the Harold White-John Coats Expedition for rare African animals; and

(3) the Frederick H. Rawson Field Museum Ethnological Expedition to West Africa. The latter expedition under the leadership of W. D. Hambly collected large amounts both of exhibition and study material representing many tribes of which little scientific knowledge had previously been available. In addition to collection artifacts, the expedition made still and motion pictures of natives engaged in various occupations and took dictaphone records of their languages.

The South Pacific was visited by the Chancellor-Stuart-Field Museum Expedition which completed its work early in the year. The expedition worked in Australia and New Zealand as well as in the Dutch East Indies and brought back important zoological collections. The Chancellor-Stuart-Field Museum Expedition to Aitutaki began operations in June and is at work collecting fishes at Aitutaki (Cook Islands).

The Marshall Field Botanical Expedition to Peru made collections of flora and woods of the Amazon Valley in Peru and an expedition to Europe is collecting materials bearing on prehistoric man and physical anthropology.

AMERICAN MUSEUM OF NATURAL HISTORY

China.—Dr. Roy Chapman Andrews leads a fifth expedition to the Gobi Desert. The interruption of the explorations of the American Museum in China by the authorities in Peiping on the ground that valuable material was being taken out of China has ended, and a satisfactory understanding has been reached by the Cultural Society of China and the Commission for the Preservation of Ancient Objects. Walter Granger, paleontologist and second in command of the Central Asiatic Expedition, and Albert Thompson, assistant paleontologist, sailed from Seattle on April 18 for the fifth and final trip of the expedition. On May 19 the party was *en route* to Mongolia.

The Ottley-Anthony South American Expedition under the direction of H. E. Anthony with Gilbert Ottley as field assistant made a reconnaissance over a wide area to lay out future fields of collecting. The party crossed the Andes at six points and visited six South American republics.

Miscellaneous—Dr. Harry L. Shapiro spent several months in Hawaii in research of race mixtures, particularly among Chinese and Hawaiian crosses. The Morden-Graves Expedition to Central Asia brought back over 150 birds and mammals from the Russian Steppes region and 200 from the Amur Valley. The Chapman-Congo Expedition collected specimens in Central Africa. Four parties, one in the Fairbanks, Alaska, gold fields and three in the Western United States were in the field in search of extinct Quarternary and late Tertiary mammals.

BEEBE BERMUDA OCEANIC EXPEDITION

The thirteenth expedition of the Department of Tropical Research, New York Zoological Society, under the leadership of Dr. William Beebe had its headquarters at Nonsuch Island, Bermuda. In addition to the trawling and the diving devices for shallow water, observations of greater depths were desirable. For this purpose a deep sea chamber or bathysphere was designed. In this a descent was made June 6 to a depth of 803 feet and June 11 to 1,426 feet with Dr. Beebe and Otis Barton, the designer, in the chamber. The bathysphere is described as 57.3 inches in outside diameter, and 1½ inches thick, and at the greatest depth withstood a pressure of 652 pounds to the square inch, or a total of 3,366.2 tons on the whole surface. The observations are thus described: "The two most surprising phenomena were, first, the abundance of life observed, and the clarity and certainty with which it could be seen and identified, and second, the blue brilliance of the watery light to the naked eye, long after every particle of color had been drained from the spectrum. Another unexpected fact was the presence of fish and invertebrates at these upper levels which, in trawling nets, have been taken only hundreds of fathoms lower. At 700 feet the spectrum, as seen close against the quartz window, was quite devoid of color, the lightest portion being at the 510th wavelength. The last color to disappear was violet, which, many feet above, had completely overlaid the blue.

"The visual degeneration of the spectrum was read every fifty feet, and rechecked on different dives and by both divers, and the radical color alteration in known species of fish agreed with the shifting spectrum. An intensity meter was read in connection with the spectroscope.

"A strong, electric searchlight illuminated the outside water to a distance of many feet, a bag of decayed fish and baited hooks served as a lure, an outside thermometer was easily read, and perfect telephone communication and dictation were carried on without interruption." The observations were telephoned to recorders on the deck of the barge and were transmitted continually during all the time the sphere was below the surface.

OTHER EXPLORATIONS

Africa.—Col. Charles W. Furlong, traveling for 7,000 miles in Kenya, Tanganyika, Uganda, the Belgian Congo and the West Nile Provinces, studying the African tribes and hunting big game, reports that data and relics of the African explorations of David Livingstone and Sir Henry Stanley have been found. A chief in a Belgian Congo village, son of one of the retinue of Stanley, has preserved these which included a letter written by Lady Stanley, a headdress which she sent and a bracelet, the gift of Sir Henry.

Australia.—The Carnegie-Australian-Harvard Expedition to Northwestern Australia has completed important investigations of the echinoderm fauna of the northern and western coasts of Australia.

Anatolia.—The Oriental Institute of Chicago University is reported by the press to have made important excavations in Anatolia and have brought to light further knowledge of the Hittite people whose sway extended at one time over all the land from Egypt to Babylon and whose subsequent disappearance from historical records has not been explained.

The Solar Eclipse Expedition of the United States Naval Observatory to observe the eclipse of the sun on October 21 stationed at Nuiafou, a small volcanic island situated about 300 miles southwest of Tutuila, reported good weather conditions.

THE BYRD ANTARCTIC EXPEDITION

By Russell Owen

Correspondent of *The New York Times* With the Byrd Antarctic Expedition

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INTRODUCTORY

Accomplishment.—The Byrd Antarctic Expedition, led by Commander —now Rear Admiral—Richard Evelyn Byrd, was the second American expedition to go into the south polar regions, and the first American expedition to set foot on the Antarctic continent. Its accomplishments were many, including the first airplane flight over the South Pole, a sledging and geographical trip to the Queen Maud Mountains, and a flight to the Northeast on which the mountains which form the eastern rampart of the Ross Sea were first discovered. The Ross barrier was also extended considerably to the east by the observations of the airplane and sledging parties.

Preparation and Equipment.—The Byrd Expedition was one of the most completely outfitted expeditions that have been to the Antarctic. Profiting by the experience of other leaders in the north and south polar regions, Admiral Byrd provided himself with supplies, food and equipment which equalled those of other expeditions and by the use of airplanes advanced the science of polar exploration. There was no sign of scurvy in any of the units of the expedition; health was uniformly good and nearly all trips were carried out without unusual dificulty. The meteorological, geological and magnetic observations will undoubtedly contribute much to the knowledge of the Antarctic and its connection with, or effect upon, other and masses in the Southern Hemsphere.

Shipping.—There were several groups in the expedition. Two ships provided most of the transportation, the *City of New York*, an old Norwegian sealing vessel, and the *Eleanor Bolling*, a steel ship, the first steel vessel to be part of an Antarctic expedition. In addition to these ships, which left New York in the summer of 1928, whaling vessels, notably the *C. A. Larsen*, carried supplies to New Zealand, where they were loaded on the ships of the expedition.

THE EXPEDITION UNDER WAY

Departure from New Zealand.—The *City of New York* left Dunedin, New Zealand, Dec. 2, and put out to sea in tow of a tug. Off the heads she was cast off by the tug and a hawser taken to the *Bolling*, which was to tow the *New York* to the ice pack, where it was hoped to make a rendezvous with the *Larsen*. Fortunately the weather was fair or the *New York* would have been in difficulties with her heavy cargo and huge load amidships, towering half way to the main yard. Nine days after leaving New Zealand the *Larsen* was reached, coal was transferred from the *Bolling* to the *New York* so as to replenish the bunkers, and the *Bolling* returned to New Zealand, to come down later when the pack should have broken up.

Bay of Whales.—On Dec. 15, the *New York*, in tow from the *Larsen*, started through the pack. The ice was thick, much more solid and heavy than the whalers had experienced for a number of years, and after a week the *Larsen* made the open water on the south side of the pack and cast the *New York* loose, in the Ross Sea. The weather was mild, the sea calm, and the ship's head was turned toward the ice barrier to the south, which was sighted Christmas evening. The next day the ship put into Discovery Inlet, and Admiral Byrd with some of the Norwegians in the crew, went ashore and skiied far inland, finding that the bay turned south much farther than had been reported. That night the ship left for the Bay of Whales to the east, where Amundsen had made his camp, and where Byrd had decided was the best base for flying operations, because of the terrain, the shorter distance to the Pole, and the absence of severe storms. When the bay was reached, however, there was some disappointment because of the heavy ice which stretched much farther to sea than when Amundsen was there. The ship was lashed to the bay ice, and after a trip ashore, Admiral Byrd selected a site for his camp about eleven miles south of the edge of the bay ice, and about four miles north of Framheim, Amundsen's base. It was at the head of an inlet on the east side of the bay, about 30 feet above sea level, and on the edge of a cup-shaped depression in the barrier. Unloading was at once begun, and for weeks supplies were hauled ashore over the bay ice. Houses were erected, wireless masts put up, supplies sorted and placed in piles so that they might easily be found.

AT LITTLE AMERICA

Unloading Problems.—As the end of unloading the *New York* drew near the problem of unloading the *Bolling* became very serious. The bay ice was getting soft and it was obvious that the heavy materials the *Bolling* carried, including gasoline and the two largest airplanes, could not be put on the bay ice and taken ashore by the old route. An attempt to break a way into a depression in the barrier was made by the *New York* with only partial success. This was abandoned.

Discovery of Rockefeller Mountains.—When the *Bolling* was only a few hours away the weather became so favorable that Admiral Byrd determined to make a flight in the smallest of the three airplanes which reached the ice, a Fairchild. With Bernt Balchen as pilot, he took off and, after flying to the northeast to the Scott Nunataks, turned to the south, and made his first discovery, that of the Rockefeller Mountains. This was Jan. 26, and while in the air he received word from the *New York* that the *Bolling* had arrived.

Unloading Difficulties.—The *Bolling*, although a steel ship and susceptible to damage, had been able with her more powerful engine to cut a way through the broken and soft ice to a sort of ice dock, lying under an incline up to the top of the barrier. Unloading began immediately, and gasoline, supplies and food had been taken to the top of the barrier, when on Jan. 29, 1929, the ice dock at the foot of the barrier broke and the slope up to the barrier slid into the sea. There were a number of important things on the dock at the time, including the invaluable center section of the Ford airplane, the ship to be used on the polar flight. After a good deal of frenzied hustling it was taken aboard the *Bolling* again. There was only one thing to do then —tie up to the barrier itself. Admiral Byrd took the chance, ordered the ships lashed to the snow side of the barrier, and unloading again went on. The big Ford fuselage was taken ashore, and men were working along the edge, when a huge piece of the barrier broke off and fell on the *Bolling*, which was lying inside the *New York*. The hawsers holding the ships were snapped, the *Bolling* heeled far to starboard and the *New York* to port, and the sterns of both ships were forced out rapidly until their noses rubbed against the snow wall of the barrier. Two men had gone overboard, one into the sea, and the other to an ice cake at the foot of the barrier, whence he clambered by a line up to the top of the cliff. Both were rescued. The task of unloading the *Bolling* was then finished in the bay, the *New York* taking on the cargo of the steel ship so that the *Bolling* could go back to New Zealand and make an attempt to come down again with more cargo. This second trip was stopped by early winter conditions which consolidated the pack earlier than usual. After that the unloading from the *New York* proceeded leisurely, and three times s
made efforts to reach King Edwa
Land, attempts which both Scott a
Shackleton had found to be imp
sible because of ice and fog.

Building of Camp.—In the mea
time work went on rapidly erecti
the houses for the camp ashore. Th
were several of these, the mess ha
which was also a bunkhouse; the m
chine shop, the Norwegian hou
which took care of six men, the a
ministration building in which A
miral Byrd and the scientific st
and others slept. There was also
house for two men which they ma
out of an engine crate and whatev
timber they could hide.

Airplane Flights.—On Feb. 18 t
planes, the Fokker and the Fairchi
Admiral Byrd in the Fokker w
Balchen as pilot, Parker and Ju
flying the Fairchild, took off for t
east. They again tried to get beyo
King Edward Land to the northe
and were turned back by clouds, a
made another trip over the Roc
fellers and farther to the south, to
point where they thought they s
land. Later in the day Capt. Ash
McKinley, aerial surveyor, with De
Smith as pilot, took off in the Fa
child and not only surveyed t
Rockefellers but also saw a dista
peak to the east in what Admi
Byrd later named Marie Byrd La

Ships Put up for Winter.—T
weather had grown progressiv
colder by this time, ice began to fo
on the bay and it was obvious th
the *New York* must leave if she w
to get back to New Zealand. She p
off Feb. 22, and after a perilous t
on which she was caught in new
and was refueled from the *Larsen*
a high sea, she finally reached D
edin and put up for the winter. T
Bolling was forced to abandon
trip south.

ACTIVITIES OF THE WINTER

Completing the Camp.—With
New York gone, the 42 men left
the ice settled down for the win
The houses were completed, but th
was a vast amount of work remain
to be done. The supplies left out
the barrier cache where they had b

unloaded from the *Bolling* had all to be dug out of drifts and brought in, snow warehouses had to be built, a tunnel connecting the two main houses, 200 yards apart, had to be constructed. There was plenty of work.

Flight to Rockefeller Mountains.—It was during this period that Dr. Laurence M. Gould, geologist and second in command of the expedition, flew with Bernt Balchen and Harold June to the Rockefeller Mountains to survey them and make a geological study of their formation. While they were there a local storm arose which blew away their plane and wrecked it. After days of waiting, Admiral Byrd with Dean Smith as pilot, took off in the remaining ship, the Fairchild, and found the men by means of flares which they lighted in the semi-darkness, as winter was coming on. Balchen and June came back with Smith who, on a second trip, went back to bring in Byrd, Gould and Hanson, the radio operator.

Workshop Construction. — That ended flying for the season, and the planes were placed in holes dug in the snow, surrounded by snow blocks, and covered over with canvas supported by bamboo poles. An airplane workshop was built out of crates a radio workship also constructed, storerooms were built off the main tunnel. The magnetist of the expedition, Frank T. Davies, built himself two snow houses for his work, and William C. Haines and Henry Harrison, meteorologists, constructed on observatory at one corner of the administration building, on and near which they also erected their anemometer and a shelter for their thermometers and instrument for measuring humidity. From their shelter they sent up more than 400 balloons for determining wind direction and velocity during the year of the stay on the ice, the most complete meterological record yet made in the Antarctic.

Preparations for Exploration.—Finally all this work was completed, and the 42 men, having unloaded more than 600 tons of supplies, settled down for the winter. That was not a time of idleness. There was work for everyone. Men who were preparing for the dog-sledding trips of the coming spring worked on plans for the trip, harness for the dogs, packed food and made canvas tanks for packing the sledges. The airplane gang worked on many things to be used on the flights—new heating covers for the motors, torches for heating, all sorts of gadgets, and in addition Balchen, who was chief pilot, worked with Sverre Strom in making sleds for the southern geological party. Clothes were made by Martin Ronne, who had been to the Antarctic with Amundsen, and also through the northwest and northeast passages with that great Norwegian leader. Admiral Byrd worked on his charts and navigation problems and supervised all the other plans for the flights and sledging parties. It was a busy place, with no time to worry about the winter darkness, which was rather enjoyed.

Auroral Observations and Radio Experiments.—All during the winter auroral observations were made and radio experiments were carried out by Malcolm Hanson, in charge of the radio work, in an attempt to learn something of the Kennelly-Heaviside layer in the Antarctic.

Overhauling the Planes.—As the sun came back, over the barrier edge on August 22, activities were redoubled, and two weeks later the aviation unit began to dig out the airplanes. Only two of them were left, the Fairchild and the Ford, the Fokker having been lost when Gould's party was stranded in the Rockefellers. During the winter the Ford in its snow hangar had been overhauled, the gas lines changed, the skiies fitted and trued, and the motors examined. When it was hauled out of its shelter all that was necessary was to put on the wing tips and warm up the motors.

Geological Expedition.—The supporting dog team party to the geological sledging party started south Oct. 15. They were to go 200 miles south toward the Queen Maud mountains, laying bases and then return. The geological party started Nov. 4, met the returning supporting party and also the crew of the snowmobile who had gone out ahead of them and broken down 80 miles south of Little America.

PRELIMINARY FLIGHTS

The first flight in this season was in the Fairchild Nov. 10. The Ford flew for the first time Nov. 13. The final plans for the polar flight called for a base-laying flight first to the Queen Maud Mountains where gasoline and oil were to be left to be picked up by the Ford on the way back from the Pole. Because of the altitude of the mountains between the camp and the Pole it had been decided that it would be dangerous and, in fact, impossible to make the flight from Little America to the Pole and back without refueling. The Ford began the base-laying flight Nov. 18, put down its supplies all right at the base of the mountains, but because of fuel leaks was obliged to land before reaching Little America on the return trip. Gas and oil were taken out to the plane and it returned safely. On this flight no sign of Carmen land, which had been reported by Amundsen south of the Queen Maud range, was found, and the later flight and Gould's investigations proved it non-existent.

BYRD'S FLIGHT TO THE POLE

The next step was the flight to the Pole. It had been found by the meteorologists that when there was a steady wind drift from the south up to a height of several miles the weather was apt to stay clear for at least 24 hours, and the flight was postponed until this condition existed. On Thanksgiving Day, Nov. 25, 1929, the weather was right, and the plane took off in the afternoon so as to reach the Pole about midnight. In addition to Admiral Byrd, the plane carried Balchen, pilot; McKinley, aerial surveyor, and June, radio man and photographer. Gould had reported good weather at the mountains, and clear skies as far as he could see over the plateau.

The flight to the mountains was made without incident, and after dropping some things for Gould, the plane began to climb for the pass through the mountains. These ramparts rise to 14,000 or 15,000 feet almost from sea level, and the problem of the flight was to carry enough gas to get them to the Pole and back to the mountain base and at the same time carry only what load the plane could take through the passes. It was decided to go up Liv Glacier, to the east of the Axel Heiberg Glacier, which Amundsen used. Careful as had been the calculations it was found that the plane would not quite make the grade and two bags of food were thrown out before the ship lifted over the last hill in the pass and came out over the plateau which averages about 9,000 feet above sea level.

As the plane neared the Pole clouds were seen ahead and to the left. They cleared ahead, however, and after raching the vicinity of the Pole by dead reckoning, Admiral Byrd turned and flew in a circle so as to be sure to come within reasonable distance of it, and then headed back toward the mountains. The storm which had been to the left began to be more threatening, but after some anxious searching of the horizon the Axel Heiberg Glacier was located, and the plane flew down to the barrier and located the fuel cache. Fuel was taken aboard and the plane took off again for Little America, which it reached 17½ hours after the start. It landed only an hour or two before a storm which would have made landing impossible.

SURVEY OF QUEEN MAUDE RANGE

After this flight Dr. Gould made his way on to the mountains, and climbed Mt. Nansen, where he made some important geological discoveries and then turned eastward. He surveyed a good part of the Queen Maud range, much farther east than it had ever been seen before and also found that the barrier extended to the east as far as he could see. As a result of his discoveries it seems more than ever likely that there is some connection between the Ross and Weddell Seas, and that the Antarctic is two continents instead of one. After planting the American flag and putting up a record of the trip in a cairn, Dr. Gould and his party turned back toward Little America, arriving there Jan. 19, 1930. He reached Latitude 85°, 27′ S. and Long. 147°, 30′ W.

DISCOVERY OF EDSAL FORD MOUNTAINS

While Gould was working his way eastward Admiral Byrd made another flight, the most important geographically and geologically of the expedition. It was to the northeast in the direction he had tried to penetrate the year before, but this time he was successful. After passing beyond the Scott Nunataks he kept on over the ice which fringed the sea, and in which many ice islands were standing, to a point where a vast mountain range rose on the horizon. He approached within about 80 miles of it, and estimated that it reached north almost to Latitude 74 N and about Longitude 143 W. From there it curved southward about Latitude 78 S. These positions are only approximate. The mountains which Admiral Byrd named for Edsal Ford have been sought ever since explorers first assumed they must be there because of the tremendous amount of ice held in the eastern part of the Ross Sea. They undoubtedly form the eastern rampart of the sea, corresponding to the mountains on the west side discovered by Sir James Clark Ross. The range may extend farther to the south, and tracing it should prove of great geographical and geological importance.

RETURN OF THE EXPEDITION

New York and Bolling Reach Little America.—That ended the flying for the season as the weather became poor until the time came for the *City of New York* to return for the expedition. The ship had great difficulty in getting through the pack, because of the unusual ice conditions, the worst seen by the whalers in many years. However, profiting by a gale which broke up the pack the *City*, as she was called, got through finally, only to meet a terrific storm on the southern side which forced her back into the pack for protection. She again made her way out when the storm abated somewhat, but was blown off her course, so that she reached the barrier at Mt. Erebus, 400 miles west of the Bay of Whales, loaded with ice and in a serious situation. Another day and she would have had to turn tail to the storm or be sunk by the weight of ice which bogged her down. Under the lee of the barrier most of the ice was chopped off and she sailed for the Bay, reaching it Feb. 18.

Return to New Zealand.—Fifteen hours later the *New York* was loaded and put back for New Zealand, making a rough but fast trip. Because the *Bolling* could not take chances with the ice the planes had to be left on the barrier; there was no room for them on the *New York*.

Arrival in New York.—The expedition broke up in New Zealand, eventually joining forces again at Panama whence all the members, including Admiral Byrd, sailed for New York on the *Bolling* and *New York*. The two vessels arrived in New York Harbor June 18, 1930, and on the following day the city staged an enthusiastic reception reflecting the country's interest in the achievements of the expedition.

COGNATE SOCIETIES

American Assn. of Petroleum Geologists, Box 1852, Tulsa, Okla.

American Geographical Society, Broadway at 156th St., New York City.

Appalachian Mountain Club, 5 Joy St., Boston, Mass.

Association of American Geographers, University of Minnesota, Minneapolis, Minn.

Explorers Club, 544 Cathedral Parkway, New York City.

Geological Society of America, Columbia University, New York City.

National Geographic Society, Washington, D. C.

Society of Economic Geologists.

DIVISION XXI

CHEMISTRY AND PHYSICS

INORGANIC AND PHYSICAL CHEMISTRY

By Hugh S. Taylor
Professor, Princeton University

MOLECULAR HYDROGEN DEVELOPMENT

There has been no outstanding event in 1930 comparable to the experimental discovery in 1929 of the two forms of molecular hydrogen, ortho- and parahydrogen, present in the ratio of 3:1. The impetus of this discovery still holds, and the development of the application of wave mechanics to chemical problems is now to be regarded as well under way with new points of view producing new theoretical possibilities and experimental investigations. Already in 1929 Bonhoeffer and Harteck, the discoverers of the two forms of hydrogen, had extended their search for different forms to other substances and recorded (*Z. physik. Chem.*, B, 5, 293, 1929) their inability to separate the two forms of the water molecule whose existence is indicated by the alternating intensities in the spectrum. Similar alternating intensities in the band spectrum of nitrogen lead to the assumption of the existence of both para- and orthonitrogen. An attempt by Justi in Berlin to demonstrate their existence, at first thought to be successful, (*Naturwiss.*, 18, 227, 1930) was afterwards shown to be due to experimental error (*Naturwiss.*, 18, 393, 1930) involving gas purity. This conclusion is confirmed by similar measurements of Harteck and Werner-Schmidt (*Naturwiss.*, 18, 282, 1930) on nitrogen as well as on methane and chlorine. As yet, therefore, ortho- and parahydrogen remain the only examples of what may be generically termed spin-isomers. Mecke has recently shown (*Z. Elektrochem.*, 36, 589, 1930) that the rotation bands of acetylene, at high dispersions, show alternating intensities in the ratio of 1:3 as in hydrogen, in agreement with the theory that they are to be attributed to the nuclear spins. This points, therefore, to the possible existence of two spin-isomers of acetylene present in ordinary acetylene in the 1:3 ratio. Doubtless these will be sought in the near future.

The reconversion of parahydrogen to the normal ortho-para mixture occurs very slowly in glass vessels at ordinary temperatures. At 1000°C. in the same vessels this change is complete in a second. Experiments have been carried out during this year on this process of reconversion. The experimental results suggest that the reconversion of para- to orthohydrogen occurs as a gas reaction during collisions of the parahydrogen molecules with atoms of hydrogen present in the gas due to dissociation by heat at the temperatures in question (600-750°C.; Farkas, *Z. Elektrochem.*, 36, 782, 1930). The rate of reaction does not increase very rapidly with temperature which might suggest that the vessel surface was active in the process but Farkas does not incline to such a view.

REACTION OF ATOMS

Methods of Production.—There has been an extraordinary interest in recent years in the very simplest of chemical reactions, since it is now known that such simple processes are the unit stages in a variety of rapid chemical processes occurring, for example, in flames and explosions. The development of technique has now permitted several methods of approach to such reactions. Atoms of hydrogen may now be prepared by a number of different methods. They are produced when molecules of hydrogen impinge on a hot tungsten filament, or when molecules are streamed through a very high tension electric discharge. They are also formed when molecules of hydrogen collide with mercury atoms which are energy-rich by reason of their having absorbed light energy. These several methods provide easily accessible sources of atomic hydrogen and have led naturally to an investigation of the physical and chemical properties of the atoms. These latter are very reactive and also relatively short lived.

Physical and Chemical Properties.—It has recently been shown that two atoms ($2H$) do not recombine to form a chemical molecule (H_2) at every collision. It is necessary that a third body be present to take up some of the energy of recombination. Thus, Senftleben has shown (*Ann. Physik*, [5], 6, 105, 1930) that a simultaneous collision of three atoms will yield one molecule and one atom; two atoms and one molecule of hydrogen will yield on simultaneous collision two molecules. The wall of the containing vessel may act as a third body absorbing the energy of combination. It has recently been found, however, that different wall surfaces have very different activities in promoting this recombination. The metal surfaces are in general very active; but surfaces like alumina and potassium chloride are relatively inefficient in promoting the recombination. It is evident, therefore, that with atom reactions as well as molecules we have the phenomenon of catalysis (acceleration of reaction by unchanged third bodies) that is so important a feature of reactions between molecules and which has led to so many interesting technical developments in the last twenty years during which the processes of industrial chemistry have been so largely "catalysed."

Free Atoms and Hydroxyl.—If we subject water vapor (H_2O) to the action of a high tension discharge we can withdraw from the system free atoms of hydrogen (H) and a radical (OH) termed hydroxyl. The recombination of these to form water ($HOH; H_2O$) obeys the same laws as found above for hydrogen atoms. Here, too, is a specific effect of surfaces and a sharp differentiation from the case of hydrogen. Alumina and potassium chloride which are inactive for hydrogen atoms are very active indeed in the recombination of H and OH. Similar specific effects of surfaces in the recombination of chlorine atoms and hydrogen and chlorine atoms have also been found. The efficiency of clean glass in this case is much greater than that of sodium chloride surfaces. Such facts are of great importance in dealing with the chemistry of such relatively short-lived species as free atoms since they dictate the choice of containing vessel in experimental studies.

Atomic Oxygen.—Oxygen molecules (O_2) when passed through a high tension discharge are also dissociated into free atoms (O) and quite recently the properties of such atomic oxygen have been under review (Harteck and Kopsch, *Z. Elektrochem.*, 36, 714, 1930). The natural expectation that such atomic oxygen would be extremely reactive has only been partially confirmed and the cases in which reaction is little are of great interest. Oxygen atoms react freely with hydrogen chloride, bromide, nitride (ammonia) and sulphide, carbon disulphide and a large variety of organic compounds which suffer oxidation with extensive formation of water, carbon monoxide and dioxide and other oxidation products. A most profound disruption of the oxidized molecules is simultaneously produced and once started the oxidation processes go to stable end products without much, if any, formation of intermediary stages.

Three remarkable cases of inactivity must be noted. Oxygen atoms are practically indifferent to hydrogen, carbon monoxide and methane. In the first case one would have expected rapid reaction to yield hydrogen atoms and hydroxyl, $O + H_2 = OH + H$. Experiment showed that not more than two per thousand such collisions were fruitful. Less than five per cent of carbon monoxide was oxidized under conditions which with reactive compounds gave complete oxidation. This points again to the necessity, in recombination reactions such as $CO + O = CO_2$, for a third body to be simultaneously present. With methane one might expect a reaction $CH_4 + O = CH_3 + OH$ but little if any was observed, checking other observations on the special stability of the molecule of methane in sharp contrast to the reactions of other hydrocarbons with atomic oxygen. These results with the discharge tube method of producing atomic oxygen were confirmed so far as hydrogen and carbon monoxide were concerned by Kistiakowsky (*J. Am. Chem. Soc.*, 52, 1868, 1930) who produced his atomic oxygen from the molecules by irradiating the latter with extreme ultra-violet light.

Fluorine.—This doubly-verified stability of hydrogen molecules towards oxygen atoms is paralleled by similar stability towards other atoms. It is known, for example, that chlorine atoms are quite unreactive towards hydrogen molecules when the reaction system is quite dry. With small amounts of moisture present the reaction $Cl + H_2 = HCl + H$ occurs readily and is one of the stages assumed in the explosive combination of hydrogen and chlorine. In this connection one of the remarkable facts learned during the year concerns fluorine. By reputation this is the most reactive of all molecules towards almost every other element, which reactivity delayed its isolation until long after many other elements had been isolated. The explosibility of free fluorine with all manner of compounds including hydrogen is commonly recorded in most textbooks. It has now been shown, however, by von Wartenberg and J. Taylor (*Gott. Nach.*, 119, 1930) that such explosions must be attributed to impurities in the gases. The pure mixture of hydrogen and fluorine does not react at all at room temperature. More remarkable still, atomic fluorine, produced by ultra-violet illumination of the molecular gas, is also inactive towards hydrogen molecules and yields no hydrogen fluoride. This inactivity towards hydrogen molecules is also to be ascribed to such radicals as hydroxyl, methyl, ethyl, HCO, which evidently also need a definite energy of activation for reaction with hydrogen.

Explosion and Flame Reactions.—The reactions of explosion and of flames undoubtedly involve atomic and radical reactions. A compelling set of experiments on the mechanism of water formation have been performed this year. The reaction between hydrogen and oxygen was initiated by introducing into the gas mixture atomic hydrogen produced by photochemical decomposition of ammonia admixed with the gas. The dissociation of ammonia is assumed to yield as a first stage NH_2 and H. It was found that, at 290°C., the ratio of H_2O molecules formed per H atom produced by ammonia decomposition was 25; at 405°C., the ratio had risen to 380 (Farkas, Haber and Harteck, *Z. Elektrochem.*, 36, 711, 1930). At higher temperatures, a further rise in the ratio signifies the production of explosions. The sequence of reactions suggested is $2H + O_2 = 2OH$; $2OH + H_2 = 2H_2O + 2H$, a sequence which, as is seen, regenerates atomic hydrogen and so makes possible the large yields per initial atomic hydrogen introduced into the reaction system. In a similar manner the carbon monoxide-oxygen explosion and flame reaction, $2CO + O_2 = 2CO_2$, is also sensitized by atomic hydrogen similarly produced and the total process may be ascribed to the sequence: $2H + O_2 = 2OH$; $2OH + 2CO = 2CO_2 + 2H$. This mechanism suggests a reason for the absence of explosions in extremely dry mixtures of hydrogen and oxygen.

Thermal Reaction.—In the purely thermal reaction of hydrogen and oxygen it has now been shown by Alyea and Haber (*Naturwiss.*, 18, 411, 1930) that the initial stage in the process occurs at the wall of the containing vessel and spreads outwards, presumably by the above reactions, into the gas phase. This was shown by crossing two beams of hydrogen and oxygen separately preheated to reaction temperature. The mixing of the heated gases, *away from surfaces*, thus secured, also eliminated *all* reaction, under conditions which, when certain surfaces were present, resulted in explosions. Glass, quartz and various metal rods inserted in the gas beams at their intersection point produced rapid reaction. It is of interest to record that an aluminum rod did not cause reaction, a highly interesting result when it is remembered that an aluminum metal surface is normally always covered with a tenaciously adhering oxide film. Alyea and Haber also showed that if an aluminum tube were used in place of a glass tube and the two gases were heated under conditions which, in glass, produce explosion, no reaction occurred in the aluminum tube. This, taken in conjunction with the fact earlier recorded as to the inability of hydrogen atoms to recombine on alumina surfaces points to the initial activation in the hydrogen-oxygen thermal explosion as the production of atomic hydrogen at the activating surface. This view makes one single uniform point of view for these several methods of water formation, and indicates atomic hydrogen as the initial activator. That these views may be generalized for explosion reactions is suggested by the subsequent observation of Thompson (*Naturwiss.*, 18, 530, 1930) that crossed streams of carbon disulphide and oxygen do not react under conditions such that reaction in the presence of a suitable surface leads to explosion.

PHYSICAL CHEMISTRY

Physical Contributions.—Yearly the indebtedness of chemistry to modern developments in physics grows apace. This year, the subject of predissociation is an important phase of the physico-chemical interaction. It has been known for some time that the band absorption spectra of molecules is normally of fine line structure but that in certain cases this structure is absent. This absence of structure has now been interpreted to signify the occurrence of an internal decomposition of the molecule to yield molecular or atomic fragments. The correlation of the energy data derived from the position of these structureless band spectra with the probable decompositions of the molecules in question has led to increased data on the energies of atomic linkages in molecules which are proving of great value in forecasting the probable directions of chemical change. Thus the energies required to remove oxygen atoms from such compounds as nitrogen dioxide, sulphur dioxide, sulphur trioxide, carbon dioxide, carbon monoxide, ozone, oxygen, and to remove hydrogen atoms from water, hydroxyl, formaldehyde, acetaldehyde and hydrocarbons such as methane have been derived more precisely within the past year and correlated with data from other sources. Thus we now know that the energies required to remove the four successive hydrogen atoms from methane are not all alike but vary greatly among themselves. A recent estimate sets these four energies as respectivly 120, 30, 110 and 110 kilo. calories, instead of 90 kilo. calories for each as hitherto assumed. The use of such data in determining possible reaction mechanisms in organic chemistry should increase in the near future.

Chemical Molecules in Liquids.—Two sets of experimental physical research are providing data on the structure and size of chemical molecules in liquid systems. Debye and his co-workers using x-rays (*Z Elektrochem.*, 36, 612, 1930) and Mark and Wierl using electron-reflection (*Z. Elektrochem.*, 36, 675, 1930) have provided two independent and mutually confirmatory methods of learning the spacing of atoms in organic liquids. The results obtained have raised interesting questions concerning the free rotation of chemical bonds which will bring the organic chemist into the discussion. He, long ago, deduced, by pure ratiocination, some of the conclusions to which these direct experiments lead. He will be interested to learn whether the concordance is complete.

Electron Reflection.—Last year we recorded the use of electron reflection as a means of studying phenomena at surfaces. The work of G. P. Thomson has this year confirmed this possibility and an extensive development in this field seems to be under way.

ORGANIC CHEMISTRY

By Charles D. Hurd
Associate Professor, Northwestern University

POLYMERIZATION PROCESSES

Until a few years ago, most organic chemists were content to relegate tars, resins and high molecular weight compounds to the waste jar. Some still do, but academic interest in the subject of polymerization is growing steadily. Staudinger's laboratory in Switzerland has done much pioneer work in this field during the past decade and studies of a similar nature have recently been inaugurated in America. Carothers' several contributions to this subject during the past year have been particularly interesting. His evidence makes it all the more convincing that these polymers are long string-like molecules which are made up of simple units held end to end. Thus, the anhydride of adipic acid, $HO_2C\text{-}(CH_2)_4\text{-}CO_2H$, as usually prepared is not the simple monomer but it was shown to be a linear polymer: $\text{-}CO\text{-}(CH_2)_4\text{-}CO\text{-}O\text{-}(CH_2)_4\text{-}CO\text{-}O\text{-}$, etc. In confirmation of its structure, this anhydride reacted with aniline giving not only the mono-anilide of adipic acid but also free adipic acid and a 25 per cent yield of adipic dianilide. Since aniline may sever the long polymeric chain in a random manner all three of these products would be expected. The monomeric adipic anhydride was obtained by pyrolysis (vacuum distillation) of the polymer, and as was anticipated it yielded only the monoanilide in its reaction with aniline.

Similarly, ethylene succinate has been shown to be a substance with a molecular weight of about 3,000. Its structure is, therefore, a long chain made up of about twenty recurring units such as: $\text{-}O\text{-}CH_2\text{-}CH_2\text{-}O\text{-}CO\text{-}CH_2\text{-}CH_2\text{-}CO\text{-}$. A hydroxyl group, capable of reaction with succinic anhydride, was at each end of this long chain. In contrast, ethylene carbonate is a simple monomer. Trimethylene carbonate existed in both the crystalline, monomolecular form and in the polymeric modification which had the appearance of glass. Tetra- to decamethylene carbonates were all powdery substances melting at about 55°C. which had 11 to 21 polymeric units per molecule. A definite crystallinity, as shown by *x*-ray diffraction patterns, existed in these polymers although outwardly they were tough and horny. The oxalate esters, ethylene oxalate and trimethylene oxalate, were polymers with molecular weights of 1,600 and 2,000. The former yielded monomeric ethylene oxalate (mol. wt. 120) when it was pyrolyzed.

In isolating a solid polymerization product from *n*-butyraldehyde at 12,000 atmospheres pressure, Conant discovered a polymer which was similar to the well-known formaldehyde polymer. Since it rapidly reverted to the original liquid aldehyde at ordinary pressure, he suggested that the energy relationships were such that the butyraldehyde polymer was stable only at high pressures. Another interesting high pressure study of the year was that of Adkins, who investigated the reduction of organic compounds with a nickel catalyst under a high hydrogen pressure (ten to two-hundred atmosphere).

RADICALS AND REACTION MECHANISM

Allylaniline was found to decompose on refluxing into aniline, propylene and a resin which appears to be a polymerization product of acroleinanil. Since these products were formed, rather than aniline and allene, Carnahan and Hurd noted that the results could be explained very well by assuming an intermediate formation of radicals, the allyl and the phenylimino radicals. Disproportionation of these radicals gave the products which were noted.

Gilman found it advantageous to postulate free radicals as essential intermediates in the reaction of alkyl chlorides (such as benzohydryl chloride) with magnesium. So also, Gomberg has demonstrated that these Grignard reagents which are so produced can be made from a free radical such as triphenylmethyl and the system "magnesium plus magnesium bromide." This investigation has cleared up many perplexing contradictions of more than twenty years' standing, relative to the formation of the Grignard reagent from triphenylmethyl chloride.

SULFUR DYES

Curiously enough, it has been found by Palmer and Lloyd that many varied types of organic substances, if vaporized and passed through molten sulfur at 300°, yielded sulfur dyes in good yield. Thus, benzene, aniline, naphthalene, furfural, alcohol, ether, kerosene, ethylene and even by-product gases all responded. As true sulfur dyes, they dissolved in sodium sulfide solutions and dye cotton, rayon or other vegetable fibres directly. The chief colors were brown, khaki and green.

METAL-ORGANIC COMPOUNDS

Tetraethyllead, the famous ingredient of "Ethyl" gasoline, has been shown by Paneth to undergo pyrolysis into lead and free ethyl. This free radical was found to be capable of combination with lead, antimony and zinc. As a reaction product, antimony yielded the liquid, triethylantimony. Mack and Geddes observed that tetraethyl-germanium also decomposes on heating to produce metallic germanium. Presumably ethyl radicals were also formed in this case. Other work on organic germanium derivatives was reported by Kraus and by Dennis. Furthermore, Kraus has continued to expand the chemistry of organic tin compounds.

Interaction of antimony trifluoride and carbon tetrachloride resulted in the formation of dichlorodifluoromethane, CCl_2F_2. This material boils at *-30°C.* and has been shown by Midgley and Henne to be well suited for use as a refrigerating liquid. It should prove especially valuable in systems where hazard would ensue due to leakage inasmuch as it does not support combustion and is absolutely non-toxic. The same cannot be said for the other liquids such as ammonia, sulfur dioxide, butane, methyl chloride which are widely used as liquids in refrigerating systems.

STEREOCHEMISTRY

Recent structures for sugar (sucrose), based on methylation evidence, have designated a butylene-oxide ring to the fructose part of the molecule. Hudson, however, pointed out this past year that methylation evidence is not infallible and he gave physical evidence which is best interpreted by assuming the ring to be of the propylene-oxide type. Of interest also is Pascu's titanium chloride reagent, which converts the *b*-forms of sugars into the *a*-form. Anderson and Otis have demonstrated that mesquite gum is a mineral salt of a methoxyglucuronic acid derivative which, in addition to this acid, yields arabinose and galactose on hydrolysis.

By treatment of sugar with conc'd. hydrochloric acid there is produced chloromethylfurfural. This has been converted into 5-benzyl-2-furfural by Gilman, who condensed it to benzene with the aid of aluminum chloride. The *syn*-oxime of this aldehyde was found to be 690 times sweeter than sugar. This is a sweetness slightly exceeding that of saccharin.

Considerable experimental evidence has been secured by Adams and his collaborators to provide a basis for an explanation of stereoisomerism in the diphenyl series. Since such compounds must have ortho positions substituted for such isomerism to occur, the most acceptable suggestion relative to the presence or absence of optical activity in this series is that the ortho positions act as obstacles to free rotation of the valence bond connecting the two phenyl nuclei. This view is supported by the fact that these compounds, if active, are almost invariably difficult to racemize. Confirmation of the accuracy of this view has been afforded by the observation that when one of the ortho restricting groups was fluorine, which has a very small atomic volume (and hence does not become an obstacle for free rotation), racemization readily occurred.

HYDROCARBONS

Alpha olefines, *i.e.*, hydrocarbons with unsaturations at the end of the carbon chain, have been studied by several investigators. Hymen and Wagner demonstrated that such olefines are more resistant to oxidation than other olefines. Also, they boil at a lower temperature. Boord has developed a method for the synthesis of pure *a*-olefines from *b*-bromoethers and zinc dust. It has usually been considered that butene-*1* was the olefine formed during the dehydration of *n*-butyl alcohol, but Lucas has developed analytical methods to show that such is only the case when neutral dehydrating agents such as alumina are used. With acidic substances like phosphorus pentoxide, butene-*2* is the exclusive product.

Studies on the pyrolysis of propylene, allene and methylacetylene have been carried out by Hurd and Meinert. With propylene, the reaction products were gases and liquids, the latter being hydrocarbons of the benzene type. Allene and methylacetylene, on the contrary, polymerized on pyrolysis into non-benzenoid liquids.

Muskat ahs perfected a synthesis of butadiene from the dichlorobutanes obtained from butyl alcohol by passing them over soda lime at 700°. In studying the addition reactions of this and other dienes, many cases were discovered where addition was *1, 2* rather than *1, 4* as Thiele's theory would have predicted. The synthesis of methylisoprene (methyl-*3*-pentadiene) was reported by H. L. Fisher. Unlike isoprene, its polymerization yielded a sticky mass rather than an elastic solid such as rubber.

Purification of several normal hydrocarbons derived from gasoline was accomplished by Shepard and Henne. They utilized the fact that chlorosulfonic acid reacts with branched chain hydrocarbons but not with continuous chain ones.

MISCELLANEOUS

Among the new industrial solvents which but recently were classed as rarities are ethylene dichloride, *di-b*-chloroethyl ether and *di-i*-propyl ether. Johnson has found it possible to synthesize the chloro- or bromofurans by halogenation of furoic acid and then by deleting the acid group by pyrolysis. Bromofuran reacts with magnesium to form a synthetically useful Grignard reagent.

Aliphatic ethers are usually regarded as inert substances. However, Underwood discovered that they may be brought into reaction with acid chlorides or acid anhydrides to yield esters if only a small amount of anhydrous zinc chloride were present. Nieuwland's synthesis of acetals by passing acetylene into alcohols in the presence of boron trifluoride is a reaction which appears to be quite general in its application. Smith and Lund have synthesized pure pseudocumene, pointing out that the material obtained from coal tar is always contaminated with mesitylene, an isomeric trimethylbenzene.

Some petroleum refineries use the Edeleanu process of purification, wherein the crudes are extracted with liquid sulfur dioxide. Bailey has shown that these extracts contain a vast wealth of nitrogen bases and an even greater amount of volatile, nonbasic nitrogen compounds. From 150 barrels of Edeleanu residues, representing about one-third of the stock (Calif. crude kerosene distillate) treated, there was obtained 50 liters of bases boiling between *180-335°*. *2, 3, 8*-Trimethylquinoline was isolated from this in a state of purity, but the mixture of bases was shown to be very complex.

It has long been known that chlorophyll compounds in ether solution when treated with alcoholic potash yield a yellow- or red-brown colored phase before turning to an intensive green. Conant has learned that these phase colors are caused by the production of unstable "chlorins" which spontaneously change into "phaeopurpurins," a new type of compound. Conant has also performed reduction experiments on porphyrins and on chlorophyll. Atmospheric oxidation regenerates the porphyrins but oxidation of the chlorophyll products yields a mixture of products including some porphyrins.

AGRICULTURAL CHEMISTRY

BY W. W. SKINNER

BUREAU OF CHEMISTRY AND SOILS, DEPARTMENT OF AGRICULTURE

SUGAR

Investigations.—In spite of the world-wide depression in the sugar industry, research on sugar technology has apparently not been greatly curtailed. The U. S. Department of Agriculture began a series of investigations in Louisiana of the clarification of cane juice with special reference to Louisiana conditions, including problems incidental to sugar manufacture from frozen and deteriorated cane. Of particular interest, also, are investigations conducted by the Department in Porto Rico and by the Sugar Planters Association in Hawaii, in an effort to determine more accurately the various factors influencing the quality of raw cane sugar. On account of the world surplus of sugar, refiners are demanding a higher quality in raw sugars. This is compelling producers of raw sugar to improve their technological processes. The Department of Agriculture is also studying the quality of direct-consumption sugars which are assuming increased importance in the industry.

Xylose.—A practical method for the manufacture of xylose from cottonseed hulls has been developed by the Bureau of Standards and the Swan Research Corporation. The successful production of xylose, however, will probably depend upon the development of commercial uses for the sugar, since it is not suitable for food.

Bibliographical.—Mention should be made of a paper by Zerban and Sattler (*Ind. Eng. Chem.* 22, 32, 1930), "Ash and Electrical Conductivity of Sirups and Molasses Derived from the Sugar Cane" and a paper by Bennett and Nees (*Ind. Eng. Chem.* 22, 91, 1930) "Viscosity of Beet Sugar Sirups."

HONEY

Owing to the frequent rejection by European countries of American honey on account of its low diastase value, investigation of this matter has been conducted by the U. S. Department of Agriculture. Several types of natural honey have been been found with low diastase value, consequently this factor cannot be depended upon to identify adulterated honey. Vansell and co-workers at the University of California (*J. Econ. Entomology* 22, 926, 1929) found a direct correlation between the diastase content of the honey and the pollen count, thus indicating that this enzyme is perhaps of plant origin.

INSECTICIDES

Pyrethrum.—During the year marked activity has been noted in the chemistry of insecticides and the development of new insecticidal materials. Tattersfield and Hobson (*J. Agr. Sci.* 19, 433, 1929) have reported further work on the estimation of the active principles of pyrethrum and have developed a shorter method for determining Pyrethrum I. Gnadinger and Corl have extended their work reported in the 1929 AMERICAN YEAR BOOK publishing their results in the *J. Amer. Chem.* (*Soc.* 52, 680) under the title, "Pyrethrum Flowers II. The Relation Between Maturity and Pyrethrin Content". McDonnell and his co-workers have also reported on these subjects during the year (U.S.D.A. *Tech. Bull.* 198)

Rotenone.—The chemistry of rotenone, the insecticidally active material obtained from derris, cubé and other plants of the so-called fish poisoning group has been developing rapidly in the Insecticide Division of the Department of Agriculture. Other publications to be noted are "Derivatives of Derritol, Dehydrorotenone, and Derric Acid" by LaForge and Smith (*J. Amer. Chem. Soc.* 52), also, the "Identity of Isotubaic and Rotenic Acids" by LaForge and Haller, and the "Constitution of Rotenone" by La Forge in the same journal. Jones and C. M. Smith (*J. Amer. Chem. Soc.* 52, 2554, June, 1930) have a paper on the Solubility of Rotenone which has a bearing from the manufacturing standpoint as it affords data for the efficient manufacture of certain types of insecticides for fly poisons, which have had an enormous development in the last few years. An outstanding paper of the year was one by Killip and A. C. Smith on the Identity of the South American Fish Poisons, "Cubé" and "Timbo" (*J. Wash. Acad. Sciences* 20, 74, March, 1930). Clark has reported on the constitution of Toxicarol Isolated from the South American Fish Poisoning Cracca (Tephrosia) Toxicaria (*J. Amer. Chem. Soc.* 52, 2461, June 1930), and Howes of the Royal Botanic Gardens, Kew, working in this same field has published a very important bulletin on Fish Poison Plants. Increased attention has been paid to methods of determining the relative toxicity of insecticides. The outstanding contribution in this field is the report of the work by Campbell and Fulmer at the International Congress of Entomologists (1929) on "A Quantitative Method of Estimating the Relative Toxicity of Stomach Poison Insecticides."

Insecticide Resistance.—Gray and Kirkpatrick (*J. Econ, Ent.* 22, 878, Dec. 1929) have shown that sublethal concentrations of hydrocyanic acid cause stupefaction of certain scale insects, during which state the are not easily killed by normal letha doses. This may have a bearing o the question of resistance which ha been attracting considerable attention. An important consideratio which is being studied by several organizations is the relation of insecticides to the quality and quantity o fruits produced.

Fruits—MacDaniels and Fur (Cornell Univ. Agr. Sta. *Bull.* 499 Feb. 1930) report work on the dusting of apple blossoms with sulphu and the relation of fertilization. Further work has been done by the U S. Department of Agriculture on th quality and character of citrus frui from trees which have been excessively sprayed with arsenicals. Th final results of this work will appea in a bulletin in the near future.

LIGNIN

Next to cellulose and pentosans lignin is the most abundant raw material available from plants. In th U. S. Department of Agriculture a systematic study is being made o the fundamental chemistry of ligni in the hope of devising some economic means of utilization of this material which is now almost entirel a waste. Catechol, guaiacol and normal propyl guaiacol have been obtained as degradation products o lignin by distilling with zinc dust i an atmosphere of hydrogen. Th work reported definitely establishe the aromatic character of lignin an indicates that these phenols are th fundamental units of which lignin i built up. The production of synthetic resins by the condensation o lignin with aromatic amines and wit furfural, has been reported. Also, barium lignin sulfonate has been prepared which seems to give promise a an effective tanning material. Studies have also been made in the Burea of Chemistry and Soils on the relation of lignin to lodging in whea and it has been shown that contrar to the views of some agricultura chemists, the lignin content of stra from lodged wheat is distinctly higher than the lignin in unlodged wheat The conclusion is reached that wher the lignin content is higher than the normal result is to make the straw more brittle causing it to break rather than bend under adverse conditions.

INDUSTRIAL FERMENTATION

New processes have been developed during the year which have attracted increased attention to the utilization of farm waste cellulose. Boruff and Buswell (*Ind. and Eng. Chem.* 21, 1181-1929) have contributed the paper on the "Fermentation Products of Cellulose." Another paper on the "Production of Thermophilic Fermentation of Cellulose," by Scott, Fred and Peterson (*Ind. and Eng. Chem.* 22, 731-1930) which is an adaption of the Langwell process may further stimulate industrial utilization of farm wastes.

TANNING MATERIALS AND LEATHER

Several contributions on the biochemistry of the soaking and liming of hides and skins have been made by the Department of Chemistry and Chemical Engineering of Lehigh University. One by Theis and Miller, "The Influence of Gaseous Environment upon Liming," (*J. Amer. Leather Chem Assoc.* 25, 2-15, 1930) is especially worthy of note. The Bureau of Chemistry and Soils (U.S.D. A. *Technical Bulletin* 169), "The Wearing Quality and Other Properties of Vegetable-Tanned and Chrome-Re-Tanned Sole Leathers" by Frey and Clarke, presents extensive comparable data on the actual wear, yields, strength, stretch, density and other properties of vegetable-tanned sole leather and chrome retanned sole leather made from the same hides. Under the auspices of the British Leather Manufacturers' Research Association, Lloyd, Marriott and Robertson have published the results of an elaborate bacteriological and histological study of the causes, effect and prevention of damage to hides known as "reddening." This paper was published in the *J. Int. Soc. Leather Trades' Chem.* (13, 538-569, 1929). An important contribution during the year was the appearance of Volume 2, second edition of the "Chemistry of Leather Manufacture" by John Arthur Wilson.

OILS AND FATS

Hess, Bills and Honeywell (*J. Amer. Med. Assoc.* 54, 1495, 1929) have found that the antirachitic potency of cod-liver oil varies inversely with the content of the oil in the liver. They also have shown that oil from livers of individual fish may vary tremendously in the antirachitic value. "The Mechanism of Transition of Drying Oils Into Protective Coating Films" is the title of an interesting article by Long in the *Paint, Oil and Chemical Review* (99, No. 1, 8, 1930). The author advances certain theories regarding the mechanism of the changes which take place. Averill, Roche and King (*J. Amer. Chem. Soc.* 51, 866, 1929) have made an outstanding contribution in preparing synthetic glycerides of known constitution and determining their more important characteristics.

NUTRITION

An important contribution during the year is the establishment of the constitution of glutathione as a tripeptide of cysteine, glutamic acid and glycine, by Hopkins (*J. Biol. Chem.* 84, 269, 1929). This important biological compound was first isolated by Hopkins in 1921. The preparation of ovarian hormone for the first time by Doisy, Veler, and Thayer (*J. Biol. Chem.* 86, 499, 1930) is an achievement of special importance. Additional work on the study of lipoids of tubercle bacilli is reported by Anderson (*J. Biol. Chem.* 85, 327-351, 1929). The U. S. Department of Agriculture reports the finding of large quantities of anti-pellagra vitamin in samples of cottonseed meal In one study it was determined that the cottonseed meal under investigation had about one-half the value of dried yeast. The full significance of this important finding is yet to be determined. It may lead to increased efforts in the preparation of a satisfactory protein human food from cottonseed. The importance which the mineral content of a feed plays in nutrition is shown in a comprehensive way by Orr in his "Minerals in Pastures and their Relation to Animal Nutrition." This book contains an up-to-date digest of the subject and includes a bibliography covering the numerous investigations with mineral feeds.

CEREAL CHEMISTRY

Since the introduction of the bleaching of flour the study of the amount and quality of color present in flour has occupied the attention of cereal chemists. Ferrari and Bailey have contributed an interesting paper on this subject in *Cereal Chemistry* (6, 347, 1930). The nature of the proteins of wheat has been the subject of study by Blish and his co-workers (*Cereal Chemistry* 6, 494, 1930). Investigations indicate that glutenin is a derived product rather than one naturally occurring as a protein substance. Numerous investigators have conducted studies on the baking quality of flour as manufactured by heat treatment, these researches being stimulated by the interesting experiments of Kent-Jones. Geddes who contributed an interesting article on this subject in *Can. Jr. Res.* (1, 528, 1929) concludes that the marked decrease in fermentation tolerance indicates the gluten quality was impaired by all of the heat treatments.

ELECTROCHEMISTRY

By Colin G. Fink

Professor, Columbia University

CURRENT CONTRIBUTIONS OF THE INDUSTRY

Among the outstanding contributions of the American electrochemical industry during 1930 were the following: (1) The electrolytic recovery of comparatively large quantities of the very rare metal, "indium," possessed of many valuable properties; (2) the discovery of appreciable quantities of germanium in electrolytic zinc solutions; (3) The commercialization of electric furnace gray iron, more uniform and stronger than the fuel furnace product; (4) The introduction of the electroplating of rhodium, a member of precious group of platinum metals, almost as white as silver, but unlike silver, absolutely tarnish-proof; (5) The outstanding success of the high frequency (Northrup) induction furnace in the steel industry.

ELECTRIC FURNACES

During the year further progress has been made in the widening of the scope of applications of the electric furnace and its supplanting of the fuel-fired furnaces. The new high chromium-high nickel alloys, such as the now well-known KA_2 or 18 and 8, owe their existence primarily to the electric furnace. Without the electric furnace these valuable industrial alloys and many others, such as the high tungsten and high cobalt alloys, would not exist today. These alloys are revolutionizing our entire building art, as exemplified by the Chrysler Building in New York.

Two other noteworthy events in the electric furnace art are the introduction of the high frequency furnace into the steel foundry and the commercialization of electric furnace gray iron.

The advent of high test cast iron marks the beginning of a new chapter in foundry metallurgy. The very high melting temperatures so readily obtained in the electric furnace bring about a uniform distribution of finely divided carbon, and a consequent decided increase in the strength of cast iron. The electric furnace provides the superheat that is distinctly beneficial to gray iron. Electric melting permits a more intimate mixture of carbon with the iron, and on cooling carbon separates into more finely divided particles. Electric furnace iron is of a very high quality.

FUSED ELECTROLYTES

Aluminum.—The output of aluminum in the United States amounted to almost one-half of the world's total, the plant at Massena, N. Y., contributing the largest proportion. The introduction of aluminum and aluminum alloys in building construction is a marked step forward in the ever increasing number of applications of this many-sided metal. A few years ago we recorded the universal adoption of aluminum and its alloys in aircraft construction. Now aluminum has entered the building and architectural field. Hundreds of tons of ornamental castings for crestings, spandrels, cornices, finials and casements have been incorporated in many of the new office buildings completed during the past year, not to mention the increasing use of aluminum office furniture and fittings rapidly gaining favor everywhere.

Magnesium, too, has witnessed a marked growth in production and application, by far the largest percentage being absorbed in aircraft construction. A number of new magnesium alloys have been introduced into the vacuum tube (radio tube) industry, magenisum possessing the very valuable property of combining with nearly every known gas, and thus greatly improving the vacuum of these tubes.

Thorium and Uranium.—Improved methods have been worked out for the production of thorium and uranium by the fused electrolyte process. Uranium metal is about as hard as normalized steel. Thorium metal is as soft as lead and posseses valuable electrical properties. It is one of the most commonly used agents for the production of thermions, the very "heart beats" of the radio tube and other vaccum tubes.

Lithium and Beryllium.—The growth of the lithium and beryllium industries has been satisfactory. Booth and Torrey have worked out a method for the electrodeposition of beryllium from solutions of beryllium salts in liquid ammonia. A very pure deposit was obtained. The method offers commercial possibilities. The chief application of these two newcomers, beryllium and lithium, in the fused electrolyte field appears to be in aircraft alloys.

AQUEOUS ELECTROLYTES

Copper.—Electrolytic copper, zinc and nickel passed through a very difficult year. The opening up of large electrolytic copper refineries in important centers outside of the United States, notably those in England, Belgium and Canada (countries which heretofore depended largely upon the United States for their copper supplies), will eventually result in an entire readjustment of the United States production and export schedule.

Zinc.—In the electrolytic zinc industry America continues to lead the world: production capacity is twice that of the nearest competitor. Furthermore, the electrolytic process is now established in the very region (St. Louis district) the adherents of the old retort process had considered permanently and exclusively assigned to them.

Nickel.—Electrolytic nickel, over 90 per cent of which originates in Canada, is fabricated at Huntington (W. Va.) and elsewhere into a wide diversity of products. Structural nickel steel consumes about 35 per cent of the total; monel, a copper alloy with about 72 per cent; nickel, 20 per cent, and nickel silver, the familiar copper-nickel-zinc base of our silver-plated spoons, about 15 per cent.

THE PLATING INDUSTRY

Chromium was again the chief metal plated. The industry is patiently awaiting the outcome of the suit on the Fink patent owned by the United Chromium, Incorporated.

Alloy Deposits.—Of particular interest is the increasing use of alloy deposits in place of single metals. Valuable contributions to this phase of the plating art were made during 1930. Heretofore brass and, in a few instances, bronze were the only two alloys commercially electroplated. Today the details have been worked out for the codeposition of copper and nickel; iron and nickel; cobalt and nickel; cadmium and zinc; lead and thallium; and, lead and silver. These coatings present valuable corrosion-resistant properties. The nickel-iron alloy deposits are also important on account of their magnetic properties.

Bullard-Dunn Cleaning Process.—A noteworthy advance in the art of cleaning metals after heat-treating, and preparatory to plating or further fabrication, is the Bullard-Dunn process, patents covering which were issued Sept. 16, 1930 (U. S. Patent No. 1,775,671). Steel, iron and other metals are electrolytically descaled and cleaned without the slightest pitting or hydrogen embrittlement. The finest hair springs of watches can be heat-treated or tempered and then cleaned by the Bullard-Dunn process without the slightest injury to the metal, a feat never before accomplished.

VARIOUS NEW DEVELOPMENTS

Alkali-chlorine Industry. — The new large Hooker electrolytic alkali plant on the Pacific Coast marks a decided step forward in the American alkali-chlorine industry. However, the expansion of the industry is still primarily dependent upon the disposal of many pounds of chlorine gas which the electrolytic alkali cells must turn out at the anode when liberating the alkali at the cathode. With the recent reductions in chlorine prices there is every indication of a wider application of chlorine in metallurgy and in the production of organic compounds.

Electrolytic Colors.—White lead, as previously recorded, is being successfully made by the Sperry electrochemical process at the East Chicago plant of the Anaconda Company. Another commercial success has been the electrochemical production of red oxide of copper for paints (anti-barnacle paints). Details have now been worked out for the production of cadmium yellow, a very brilliant and permanent yellow.

The De-ion Circuit Breaker.—The de-ion grid circuit breaker developed by the Westinghouse Company is a radical departure in principle and design. It is a major improvement in the art of opening high voltage circuits under short circuit conditions. The arc is drawn in a narrow slot and held in this confined space by the magnetic field; the arc path is "deionized."

INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING

By Sidney D. Kirkpatrick

Editor, *Chemical & Metallurgical Engineering*

ECONOMIC ADVANCE

Serving as a stirring challenge to chemical engineering initiative and industry, the depression of 1930 was not without its benefits. Faced with the demand for lower costs or the development of new products or processes, the chemist and engineer applied their research and technology under the spur of necessity. As a result of this creative activity, the chemical industries as a whole were less severely affected by the adverse business conditions than prevailed generally throughout industry. Furthermore because of the diversity of their production and the inherent flexibility of their processes, these industries were able to change quickly in order to adapt themselves to the varying requirements of the market situation. Just as the war witnessed certain chemical industries changing almost overnight from dyes to explosives, so the emergency of 1930 saw comparable shifting of the burden of output from, say, rayon and lacquers to cellulose wrappings or from fertilizer materials to new synthetic resins and pastel-colored plastics. Other allied industries—soap, for example—profited from the purchase of extremely low-priced raw materials without major diminution in the demand or price paid for the finished product. Measured in terms of the consumption of electrical energy, chemical industry operated at approximately 140 per cent of the 1923-5 average for the first nine months of 1930 as compared with an average of about 130 per cent during the comparable period in 1929. The last quarter of 1930, however, was marked by a decline sharply in contrast with the increased activity that characterized the close of 1929. Fortunately there were definite prospects for a gradual recovery as 1931 opened. Only fertilizer and petroleum refining were scheduled for decreased production, while the automobile, steel, building, textile and other industries that are large consumers of chemicals had announced plans for greater production.

WORLD SUPREMACY OF AMERICAN CHEMICAL INDUSTRY

Comparisons in Production.—The strong position of the American chemical industry in relation to world production was revealed in a report published during 1930 by the German trade association—*Verein zur Wahrung der Interessen der Chemischen Industries Deutschlands.* This showed that the total of the world's chemical products had increased from approximately $2,360,000,000 in 1913 to $5,226,000,000 in 1927. Analyses of these figures made in August, 1930, by the *Index* of the New York Trust Company, showed that, while in 1913 the United States accounted for 34 per cent of the world production, in 1927 its contribution had increased to approximately 43 per cent. Where this increase came from is apparent by comparing the German, British and French percentages. Thus Germany was responsible for 24 per cent of the total in 1913 but only 16 per cent in 1927. Similarly Great Britain's share fell from 11 per cent in 1913 to 9.5 per cent in 1927; France also dropped from 8.5 to 6.8. On the other hand, Italy, Japan, Canada, Belgium, Holland and Switzerland, in addition to the United States showed production increases, some of them of startling proportions. Canada, for example, reported the largest increase (450 per cent) Japan was second with 366 per cent.

INDUSTRIAL RESEARCH

Contrary to the practice of a number of chemical companies in the depression of 1920-21, there was no wholesale discharging of research workers in 1930 or the complete abandonment of laboratory and experimental study, As a matter of fact, a number of the larger corporations made even greater appropriation for this work, recognizing it as a form of investment that would best insure future dividends. Dr. John Johnston, director of research for the U. S. Steel Corporation, in an address at the dedication of the Packard Memorial Laboratory at Lehigh University in October, 1930, estimated that $100,000,000 was spent that year in research conducted in more than 1,500 industrial laboratories. He cited the fact that the limiting factor in the recent growth of research has been the supply of thoroughly trained personnel, which up to the present time has been largely recruited from the universities and scientific institutions. Dr. Johnston predicted that within the near future many of our discoveries in fundamental as well as applied science would come from the industrial research laboratories.

TECHNICAL ACHIEVEMENTS

To summarize the outstanding technical developments of 1930, is difficult because of the overlapping in time of research and commercial exploitation. The new high-pressure technology, that received its impetus from the work in recent years on nitrogen fixation and the methanol synthesis, produced synthetically during 1930, many of the higher alcohols widely used as lacquer solvents. The first commercial plant for the hydrogenation of petroleum at high pressures and temperatures went into successful production during the fall of 1930. New synthetic organic chemicals were produced with peculiarly advantageous properties for use in mechanical refrigeration or as solvents and disinfectants, or in plastics and molding compounds, or as new boiler media. New corrosion resistant alloys were announced and many of the older materials such as the stainless steels were produced in 1930 on a scale that permitted their use in building construction and in other important applications. All in all, the intense interest in novelty, whether in new processes, products or properties, had a stimulating influence on the output of our chemical research laboratories.

NEW TECHNOLOGY OF HIGH TEMPERATURES AND PRESSURES

High pressures and temperatures are the two great available agencies for accelerating the reactions of industrial chemistry, but to direct and control these effectively and profitably has called for an entirely new technology on the part of the chemical engineer. He has had to solve many practical problems in the design and construction of equipment and the development and selection of proper engineering materials. Large pressure vessels, single units weighing as much as 200 tons, have been built for pressures upward of 1,000 pounds per square inch and temperatures above 1,000 degrees Fahr. Alloy steel forgings are in service at pressures of 15,000 pounds per square inch. Yet we are only at the threshhold of what may ultimately develop from the application of this new technology.

SYNTHETIC VS. CHILEAN NITRATE

Nitrogen fixation has become one of the largest heavy chemical enterprises in the United States. The total output of synthetic ammonia was at the rate of about 500 short tons per day of anhydrous ammonia for most of 1930. The capacity of existing nitrogen plants and those under construction or immediately projected is only slightly less than 1,000 tons per day or 360,000 tons per year. This represents an estimated investment of approximately $75,000,000.

In the face of this rapid growth, the natural nitrate industry of Chili took desperate steps during 1930 to meet the competition of the synthetic product. By a drastic reorganization, the entire industry was consolidated into a huge corporation capitalized at $375,000,000 with half of the total stock issued to the Chilean government. In return the state turned over certain undeveloped nitrate lands and repealed the export tax except for the guaranteed payment by the corporation during each of the first four years of a sum averaging about $20,000,000. By this move the corporation also came into possession of the new Guggenheim process, which promises considerable economies in operating costs, although requiring much larger capital investment. At the close of 1930 it was confidently expected that the American public would be asked to finance at least a part of the cost of carrying the plan into effect. Whether this will solve the fundamental difficulties into which this one supreme monopoly has drifted remains a hotly debated question.

APPLICATIONS OF HYDROGENATION

Petroleum refining is another industry to feel the effects of the new high pressure-temperature technology. The hydrogenation process, which during 1930 reached large-scale operation in the 5,000 barrels per day plant at Bayway, N. J., demonstrated unexpected flexibility. As first announced, its principal application was for converting high sulphur, asphaltic crude oils and refinery residues into gasoline, giving yields that exceeded 100 per cent on a volume basis. Later it was shown that it was possible by hydrogenation to convert low-grade lubricating distillates into high quality paraffin-base motor oils. Likewise low-grade kerosene could be economically refined to give improved burning oils and gasoline. The fourth application was to remove sulphur and promote gum stabilization in gasoline from cracked naphthas, high in sulphur. The last, and one of the most interesting uses, was to de-hydrogenate paraffinic gas oils to give anti-knock gasoline, thus demonstrating the complete flexibility of the whole process.

NEW ORGANIC SYNTHETICS

Butyl, amyl, and other higher alcohols, as well as methanol, were available during 1930, as products of high pressure synthesis. In one of the nitrogen fixation processes in use in the United States, the residual carbon monoxide in the nitrogen-hydrogen mixture is removed by conversion over a catalyst into methanol and the other alcohols. The latter products are now fractionated and refined to produce solvents and thinners for lacquers and plastics.

A new use for synthetic methanol which assumed large proportions in the fall of 1930, was as an anti-freeze in automobile radiators in competition with denatured alcohol. Although of lower boiling point, methanol evaporates more slowly and because of its lower molecular weight, 75 parts of methanol have the same anti-freeze effects as 100 parts of denatured ethyl alcohol. With the price advantage in favor of methanol, lively competition was under way at the close of the year and it remained to be seen which product would ultimately win the greater favor. Synthetic methanol production for 1930 was estimated to be about 7,000,000 barrels and was confined to three plants located at Belle, W. Va., Peoria, Ill., and Niagara Falls, N. Y.

NEW REFRIGERANTS

Of the synthetic organic chemicals first produced commercially, major interest was shown in the announced discovery of a new non-toxic and non-flammable refrigerant—dichloro- difluoromethane. The work was done by Thomas Midgley, Jr., and Dr. A. L. Henne in the laboratories of the Frigidaire Corporation. Although the new refrigerant will not be produced on a large scale for perhaps two years, it appears to have interesting possibilities for application in enclosed spaces aboard ships, in sleeping rooms and in mines where the use of the more common materials may involve health hazards in case of leaks or explosions.

The first pound of solid carbon dioxide was sold for commercial refrigerating purposes in 1925. Four years later the output had mounted to about 15,000,000, and it was estimated by D. H. Killeffer, of the Dry Ice Corporation, that the sales in 1930 would practically double those of the preceding year. Thus within five years this industry has grown to the extent that it already exceeds the annual production of liquid carbon dioxide. The new product has its widest application in mobile refrigeration, such as the packaging and transportation of ice cream, frozen foods and similar products.

PLASTICS AND RESINS

The saving promise in an otherwise disappointing year for plastics and synthetic resins was the application of really large sizes and forms to various types of interior construction. Several hotels and many offices used panelling of the phenol-formaldehyde type of resin and thus greatly expanded future prospects for this material. Another movement of significance was the increased adaptation of these resins to quick-drying varnishes, which can compete more evenly with the dominant lacquers.

The phenol-type resins are also entering the field of decorative products where other materials have held sway. This is the result of improved colorations recently achieved and applies to such applications as telephone sets, table services and the like. However, the producers of the lighter thermoplastic compounds, cellulose acetate and nitrate and urea-formaldehyde, have also been aware of the possibilities in this market, so that the past year has seen an effective increase in their efforts.

Cellulose nitrate was adversely affected during 1930, by the sensational decline in automobile production and consequently smaller use in safety glass and automobile curtains. Sale of acetate, toward the end of 1930 was being developed by several companies as stock for transparent wrappings in competition with viscose (regenerated cellulose), which had greatly increased in output during the year. Plastics of the urea-formaldehyde type, of great clarity and delicately colorable, made these properties the basis of very energetic distribution efforts during their first real commercial year.

The vinyl and glycerol-phthalic anhydride resins continue to advance in the coatings field, as their producers are gradually introducing them to this market.

RAYON

Rayon did not experience a satisfactory year in 1930. With production capacity somewhat more than twice the actual output and a badly demoralized price situation (rayon sold at the lowest figure on record) it is not surprising that activity in new development was at a low ebb. No technical advances of significance were evident in commercial plants during the year.

Most notable of the trends was one set in motion originally during 1929. This was the increase in acetate rayon production. Two producers put new acetate plants in operation during the year, while a third commenced laboratory scale development. Where there was one acetate manufacturer in 1928, there are four actually producing at present. Acetate production for the year is estimated to be considerably in excess of 10,000,000 pounds, as compared with about 7,000,000 pounds in 1929. Total rayon production, on the other hand, is expected to be slightly less or about equal to the 1929 figure of 123,000,000 pounds.

MARKETS AND FOREIGN TRADE

Raw Material Prices.—Although production and consumption of chemicals were maintained on a relatively higher basis than was reported for industry as a whole, there was a marked falling off from the levels reached in 1929. In the early part of the year production was at a rate in excess of consuming demand and surplus stock began to accumulate. Under this influence, prices started a downward movement. Raw materials shared in the price recession but as the majority of buyers were under contract, they were not able to take full advantage of the lower quotations. Hence the decline in production costs for finished chemicals was not in direct proportion to the drop in values for basic materials. The extent of price fluctuations during 1930 may be measured by the fact that the weighted index number of *Chemical & Metallurgical Engineering* stood at 98.57 for January as compared with 93.17 for December. Contract business in heavy chemicals for delivery over 1931 has been placed at considerably lower levels than a year ago which is a reflection of the position of raw materials.

Export and import trade in chemicals compared unfavorably with that for 1929. From a valuation standpoint, outward shipments dropped about 13½ per cent from the total for 1929, while imports suffered a loss of approximately 20 per cent. Economic conditions in foreign markets rather than expansion of foreign chemical industries was responsible for the slower export movement. To a large extent, the decline in imports was due to the fact that American production is taking care of an increasingly large part of domestic requirements.

PHYSICS

By F. G. Tucker
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MATTER WAVES

The wave-mechanics of de Broglie and Schroedinger shows that a particle of mass m moving with a velocity v may be represented by a plane wave in three-dimensional space and the wave length of this *psi* wave is given by de Broglie's relation $\lambda = \frac{h}{mv}$ where h is Planck's constant, m is the mass of the particle and v is the velocity of the particle. The validity of this relation, in the case of free electrons has been demonstrated by the experiments of Davisson and Germer, G. P. Thomson, Rupp Kikuchi and others.

The most significant development in physics during the past year has been the experimental proof that atoms and molecules may be diffracted by a crystal as if the beam of particles were a plane wave. The observed diffraction patterns are consistent with the equation of de Broglie that $\lambda = \frac{h}{mv}$.

Estermann and Stern (*Z.f. Physik* 61; 95, 1930) studied the reflection of a stream of gas molecules, He and H_2, from crystals of sodium chloride and from lithium fluoride. The gas stream was projected from an oven, the velocity of the molecules being controlled by the temperature of the oven. The reflected beam was detected with a sensitive manometer. The intensity distribution of the reflected He and H_2 molecules, was identical with that of a plane wave diffracted by a crossed grating. Taking the grating space as the distance between similar *ions* of the lithium fluoride crystal, the calculated wavelength was consistent with de Broglie's relation.

The experiments of Johnson (*J. Franklin Institute,* 210; 135, 1930) are of special interest since the diffraction patterns were registered photographically. The particles in this case were atomic hydrogen and the reflecting crystal was lithium fluoride. In this case also observed diffraction patterns were those of a wave, of wave-length λ, as calculated by de Broglie's equation. These two experiments seem to constitute definite proof of the wave nature of atoms and molecules so that the wave-particle duality which had been established for electrons and photons, has now been extended to atoms and molecules.

In this connection, the work of Dempster, (*Phys. Rev.* 34, 1493, 1929) on hydrogen canal rays, or protons, deserves mention. In the first experiments diffraction effects were obtained which seemed capable of explanation by means of de Broglie waves. Subsequent work, however, indicates that the phenomenon is more complex, and not capable of being explained as the diffraction of a plane wave by a crossed grating.

REPETITION OF MICHELSON-MORLEY EXPERIMENT

The ether drift experiments of D. C. Miller were discussed in the 1929 AMERICAN YEAR BOOK. Since his results seemed inconsistent with the special theory of relativity the experiment has been repeated by the staff of Mount Wilson Observatory and by Professor Joos at the University of Jena. In both cases extreme precautions were taken and important improvements were made in the details of the apparatus. The displacement of the fringes was found to be zero in all cases, within the limits of experimental error, which was approximately 1/1000 of the distance between interference fringes. Miller on the other hand had found a shift of approximately 1/10 of the fringe distance which was interpreted as indicating a motion of the earth through a fixed ether with a velocity of 10 kilometers per second. These experiments seem definitely to disprove Miller's hypothesis.

INTERFERENCE MEASUREMENTS WITH SINGLE MOLECULES

P. Debye of the University of Leipzig has developed a new method of studying molecular structure, which is yielding important results and gives great promise for the future. The study of crystal structure by means of x-rays has been one of the most fruitful fields of research since 1913. In crystal analysis, every atom of the crystal is supposed to be the center of secondary radiation and the observed diffraction effects are explained as due to the arrangement of the atoms in the lattice.

Debye (*Proc. Phys. Soc. London* 42, 340, 1930) points out that this crystal regularity although responsible for the special character of the scattering is not essential for the existence of interference effects. He then says: "Any atomic structure will give rise to interferences; and even if only a very small number of atoms be contained in such a structure an effect should still be observable provided only that the wave length of the radiation is comparable with atomic distances."

In order experimentally to observe the interference effects, a large number of scattering centers must be present. Since the molecules are oriented at random it seems that the effects would annul one another. Debye's theoretical calculation, however, shows that the intensity of the scattered x-rays will exhibit maxima and minima. The position of these maxima is a function of the wave length of the x-rays and of the distance between the scattering atoms in the molecules. Since the wave lengths of the x-rays are known, the molecular dimensions can be calculated from the positions of the observed maxima.

The first successful experiments were made with $C\ Cl_4$ vapor, and the average distance between the Cl atoms was found to be $2.99\ x\ 10^8$ *cms.* The theory of the scattering predicts that the interference maxima should become less pronounced for molecules with three or two scattering atoms. These predictions have been verified by studying the maxima obtained with $CH\ Cl_3$, $CH_2\ Cl_2$ and $CH_3\ Cl$. The shift in position of the first maximum showed that the distance between Cl atoms increases, when a Cl atom is replaced by an H atom.

Inspired by the work of Debye and the fact that electrons are diffracted by a crystal, Mark and Wierl have obtained diffraction patterns of electrons scattered by vapors. Their results with $C\ Cl_4$, assuming de Broglie's relation to calculate the wave-length associated with the electron beam, are in agreement with the results obtained with x-rays. It is an interesting fact that fewer experimental difficulties were encountered with the electron diffraction than with the scattering of x-rays. Further work in this field will no doubt yeild important results on the structure of molecules.

COSMIC RAYS

The interpretation of recent experiments upon cosmic rays has been the subject of considerable discussion. The work of Bothe and Kohlhoerster in Germany and of Curtis in America indicates that the ionisation produced by cosmic rays is due to very penetrating corpuscular rays. The question then arises as to whether or not the corpuscular radiation is identical with the cosmic rays themselves or due to secondary rays, probably high speed electrons, produced by the primary electromagnetic radiation. It has been suggested that electrons traveling with a velocity of 10^9 equivalent volts would explain the observed effects. Epstein, (*Proc. Nat. Acad. Sci.* 16, 658, 1930) however, shows that electrons of this energy cannot hit the earth outside of two limited zones around the magnetic poles, on account of the deflection in the earth's magnetic field. Since the ionisation due to cosmic rays has been detected outside these zones this hypothesis is untenable. According to Epstein, therefore, only the three following hypotheses concerning the nature of the rays are possible: (1) They are electromagnetic waves of very short wave-length; (2) The rays are corpuscular, but have energies much greater than 10^9 volts; (3) The rays have a terrestrial, and not cosmic, origin. Millikan and his collaborators support the electromagnetic wave hypothesis.

Interpretation of the physical significance of cosmic ray absorption coefficient is based upon an extrapolation of the Klein-Nishina formula for the absorption of hard gamma radiation. This formula has been carefully tested by the experiments of Chao and Meitner. Both observers find that the absorption coefficient per electron increases with atomic number instead of remaining constant as predicted by theory. In the case of lead Meitner finds a deviation of 40 per cent from the theoretical absorption. It is suggested that this increased absorption is due to scattering by electrons in the nucleus, or preferably, according to Beck, by the D particles. Millikan and Cameron find a similar shift in the absorption coefficient of cosmic rays and interpret it as additional evidence for the similarity of gamma rays and cosmic rays. The deviations from the Klein-Nishina formula, in the case of light elements, do not appear to be large enough seriously to call into question the atom-building hypothesis of Millikan.

HIGH VOLTAGE X-RAY TUBES

In order to produce *x*-ray comparable in penetrating power, to the gamma rays of radium, special tubes, operating at very high voltages are required. Two laboratories have announced the successful production and operation of such tubes. Tuve, Halstead and Dahl, of Washington, D. C., used a twelve-section tube inside a Telsa coil, six inches in diameter. The electron velocities were determined by deviation in a magnetic field, and were found to be equivalent to 1.3 million volts. The radiation produced by the impact of these electrons, although of small intensity, had a penetrating power of the same order of magnitude as that predicted by theory.

Brasch and Lang, University of Berlin, have succeeded in operating a tube at 2.4 million volts. The potential was applied in pulses of short duration. The radiation emitted by a copper target, produced a blackening of a photographic plate, after passing through a lead shield, *10 cms.* thick. These high speed electrons and the penerating *x*-radiation produced by them, have been designated "artificial *B* and *y* rays."

QUANTUM THEORY OF METALS

A satisfactory theory of metals must "explain" a great variety of phenomena. The more important effects to be accounted for are: variation of resistance with temperature, supraconductivity, resistance change in strong magnetic fields, thermionic emission, electron extraction with strong electric fields, photo-electric effect, cohesion and ferromagnetism.

In 1928 Sommerfeld pointed out that the difficulties of the old electron theory of Drude vanished when Fermi statistics was applied to the problem. The difficulty of correlating conductivity and specific heat disappeared and supraconductivity was explained by the fact that the de Broglie waves of a free electron are not scattered by a perfect crystal lattice. The effect of impurities, strains and thermal agitation is to disturb the lattice and thereby increase the electrical resistance. In the theory of Sommerfeld the interaction of the Coulomb forces between each pair of electrons or *ions* was ignored. Heisenberg and Bloch (1928) showed that by taking account of these interactions and of the magnetic moments of the electrons themselves, the theory could be extended to include ferromagnetism.

Slater (*Phys. Rev.* 35, 509, 1930) has succeeded in extending the theory of Heisenberg and Bloch to include cohesion. The cohesive forces are found to be of the same general nature as those of homopolar binding, discussed by Heitler and London. A detailed analysis for atoms with one valence electron, showed that a small fraction of the electrons will be detached from their atoms leaving an equal number of positive *ions*. These electrons may be properly designated "free electrons" and are essential for conduction.

The outer electrons of the atom, which are probably entirely responsible for cohesion and conduction cannot produce ferromagnetism. The ferromagnetic effects, therefore, are assumed to be dependent on the existence of incomplete shells within the atoms, rather far apart in the crystal. On this hypothesis the metals most likely to exhibit ferromagnetism would be *Fe*, *Co* and *Ni*. This also gives an explanation of the ferromagnetic properties of Hensler's alloys, by assuming that the copper is so highly ionized that its incomplete three quantum shell is deep enough in the interior of the atom to become available for interchange interaction.

F. Bloch, using the methods of Slater has extended the theory to cover the change of resistance at low temperatures, while Peierls, by taking account of the potential field due to the metal ions has made a promising start toward a satisfactory theory of the change of resistance in strong magnetic fields.

The quantum theory of metals is in an embryonic stage of development. Many refinements will undoubtedly be made. The present situation is summarized by one of the leading workers in the field, R. H. Fowler, (*Nature*, Oct. 18, 1930) as follows: "Part of my faith in quantum mechanics is derived from the fact that for any physically reasonable model it provides results which are always in good sensible accord with the requirements of experience. Theory and experiment may both be pushed ahead in the confident expectation that we are on the right lines and that progress will be sure and not particularly slow."

The great increase in interest in this field is evidenced by the following recent publications, where the reader will find more detailed discussions of current problems. "Discussion on Magnetism" (*Proceedings of Physical Society of London*, 42, p. 355-466, 1930). (*Leipziger Vortraege 1930*), "Elektronenirterferenzen," published by S. Hirzel, Leipzig. "Magnetism Is Discontinuous Media," by L. W. McKeehan (*Reviews of Modern Physics*. 2, 477, 1930).

PHOTO-ELECTRIC EFFECT

Anderson (*Phys. Rev.* 35, 1140, 1930) has studied the space distribution of photo-electrons emitted by gas radiated with monochromatic rays. The space distribution for electrons from the *K* energy level was i fair agreement with the quantum mechanical theory of Wentzel. The distribution of electrons from the *L* energy levels was more isotropic tha in the case of the *K*-electrons, bu the isotropy decreased with an increase in the frequency of the incident radiation. This change is i approximate agreement with the theoretical calculations of G. Schu (*Ann. d. Physik* 4, 441, 1930).

Although a great amount of experimental work had been done upon th photo-electric emission from thin metallic films no satisfactory theory o the phenomena had been proposed Froehlich (*Ann. d. Physik* 7, 103 1930) has extended Wentzel's quantum mechanical method to includ this case. The theory accounts fo the relative position of maximum photo-current with reference to th threshold. It also predicts that th energy distribution curve will hav a pronounced maximum near th highest velocities. This effect ha been found experimentally, and seem to be additional evidence for the essential correctness of the assumptio that the electrons in the metal obe the Fermi distribution law.

COGNATE SOCIETIES

American Chemical Society, Mills Bldg., Washington, D. C.

American Electrochemical Society, Columbia University, New York City.

American Leather Chemists' Assn., 143 W. 20th St., New York City.

American Microscopical Society, University of Illinois, Urbana, Ill.

American Physical Society, Columbia University, New York City.

American Society of Biological Chemists, Columbia University New York City.

American Society of Chemical Engineers.

Copper and Brass Research Assn. 25 Broadway, New York City.

National Research Council, 29 W 39th St., New York City.

Society of Chemical Industry Pratt Institute, Brooklyn, N. Y.

Synthetic Organic Chemical Manufacturers Assn., 1 Madison Ave. New York City.

DIVISION XXII

BIOLOGICAL SCIENCES

ORGANIC EVOLUTION

By G. Kingsley Noble

The American Museum of Natural History

Peking Man.—Great advances in both descriptive and experimental evolution have been made in the past year. Equally important are the fossil finds which have helped to clear up some disputed points in man's history. Further study of the Peking man has shown it to be one of the most important discoveries ever made. Many features of the skull show that the Peking man was at the very base of the human stem and with the much discussed Pithecanthropus very near this main line at the point where it branched from the anthropoid stock.

Modification of Hereditary Factors.—Discoveries of geneticists have at last brought the observations of the naturalists in line with those of the animal and plant breeder. Fifteen or twenty years ago the geneticists were speaking of the gene or hereditary factor for various differences between animals. If a man was born with a poor set of teeth it was sometimes assumed he was an example of disharmonic inheritance, having received the hereditary factor for a small jaw from one parent and large teeth from the other. This idea of unit characters was applied even to such features as the brain and its functions. Recent work has indicated this concept must be modified. There are some fifty genes for the eye-color alone of the fruit fly, Drosophila. These genes are located in the chromosomes, the most conspicuous part of the nuclei of the animal or plant cells. They function at different stages of development but they all act together at every stage in producing the characters. Again, geneticists of twenty years ago were mostly concerned with conspicuous differences in their breeding studies. In nature these differences were called "sports" or mutations. Recent work has shown conclusively that the small differences between species and subspecies are also of the same nature as these sports. They are both due to changes in the genes.

Experimental Mutations.—By means of x-ray and radium treatment, experimentalists have been able to induce mutations and hence create new types of animals and plants at will. Evolution is no longer a theory but a practical demonstration. It is still a question whether radium deposits in nature or other external factors induce changes in the animal and plant world. It would seem that environmental factors must in some way produce hereditary changes in the life on the earth. But these changes so far as known were never in direct response to a particular condition. The water habitat, for example, has never brought forth webs on any non-aquatic animal subjected to it. All the adaptive changes that we know seem to have been brought into existence indirectly by nature's weeding out those mutations or varieties which were not particularly suited to live under these conditions.

Acceptance of Darwinism.—This, in brief, is Darwin's concept of natural selection, which is today on more solid footing than ever before. Darwin did not know what produced the many varieties of any one species which he found in nature, but he assumed that evolution in time was produced by the weeding out of the varieties which did not happen to be so well fitted to live under any set of conditions. The more fit varieties would live and propagate their kind. In this way a gradual advance or improvement in the race would occur. The modern biologist thus accepts Darwinism in its entirety. With the advance of science it has been further established that the varieties, namely, the material for natural selection, are due to the changes in the hereditary factors in the chromosomes.

VERTEBRATE ZOOLOGY

By James E. Kindred

Professor, University of Virginia

MORPHOLOGY

Nervous System.—The degeneration of nerve fibers has been studied in man and the rat by Duncan who found that degeneration is normally present in a small percentage of nerve fibers in normal animals. Ide measured the areas of nerve fibers in sciatic nerves of male and female rats in youth and age and found that there is an increase in the size of the fibers with age and that in females it is greater than in males. Cole describes the existence of anastomosing neurons in the myenteric plexus of the sigmoid flexure of the human colon.

Blood.—Christianna Smith reports that the red blood cell count of trout rises when the fish are fed liver. The blood cells of a number of different types of salamander have been studied by Dawson and the origin of the erythrocyte traced to a lymphoid hemoblast present in the circulation. This same lymphoid hemoblast has been found to be especially active by Jordan and Speidel in furnishing erythrocytes in animals that have been deprived of the normal erythrocytopoietic organ, the spleen. The blood corpuscles of the male albino rat have been counted by Vaughan and Gunn and are as follows: red blood corpuscles, 10 million per cu.mm.; white blood corpuscles 13,300 to 15,900 per cu.mm.; and platelets, 1,275,000 per cu.mm. Kunde *et al.* give the *rbc* count of rabbits at birth as 4 to 5 millions per cu.mm. For older rabbits the *rbc* count given by Pearce and Casey is about 5 million; wbcs, 6,761 to 10,585. According to Powers the *rbc* count of dogs averages about 7 million per cu.mm.

Urogenital System.—Fitzpatrick gives a description of bilaterally placed functional ovaries in Cooper's hawk. The estrous cycle of the cow has been studied intensively by Cole to determine the durations of the different stages. Ovulation was found to occur one day after the beginning of postestrum. Hargitt presents more evidence from the rat that there is a continuous prolifration during maturity of germ cells from the peritoneal investment of the ovary. Swezy and Evans describe in detail the early origin of germ cells in the human ovary. The germ cells begin to proliferate from the peritoneum during the third month of gestation. Moore, from a study of the glomeruli in different types of kidneys, concludes that congenital defects of growth of partial hypertrophy cause no alteration in the number of glomeruli.

Endocrine Glands.—A distinctive histologic zone, the "X zone", has been found by Howard in the cortex of the suprarenal gland of the mouse. This zone is transitory and degenerates in males upon sexual maturity and in females at the onset of ovulation. Philip Smith and McDowell describe the structural abnormalities which are present in the thyroid gland, suprarenal glands, gonads and hypophyses of individuals from a strain of dwarf silver mice. Implantation of pieces of the anterior lobe of the hypophysis effected a return to normal condition in the thyroid and suprarenal glands, but did not affect the degenerate anterior lobe of the dwarf mice.

CYTOLOGY

Cytoplasm.—O'Leary studied the living islet cells of the pancreas of the mouse and found that the canals of Holmgren appeared in quiescent cells as a network of clear spaces not affected by neutral red. The mitochondria of the cells were selectively stained with Janus green B. Beams presents evidence for the view that the Golgi apparatus, mitochondria and vacuome are distinct entities in the islet cells of the pancreas of the albino rat. The neutral red bodies and the Golgi apparatus are shown to be independent of each other following osmic acid treatment. The same distinction between vacuome and Golgi apparatus has been found by Beams to be characteristic of these structures in the acinar cells of the albino rat. Moloy and I. H. Smith state that the filamentous mitochondria characteristic of the resting cells of the submaxillary gland of the rabbit assume red-like and globoid forms following stimulation of the chorda tympani, but are not modified by stimulation of sympathetic fibers. No changes were observed in the morphology of the mitochondria of the thyroid gland cells following similar stimulation. The mitochondria of the sensory cells of the lateral line organs of several salamanders are described by Chezar as being both filamentous and granular. Fibers from medullated nerves are described as ending intracellularly around the granules in the bases of these cells. Arey gives a series of excellent diagrams describing the transformation period of the human spermatid from preparations of the late Professor Bowen of Columbia University.

EMBRYOLOGY

Histogenesis and Morphogenesis.—The histogenesis of cartilage preparatory to enchondral ossification is described in fetuses of dog, cat, pig and man by Dodds. McEwan, from a study of the eggs of a teleost fish, Haemichromis bimaculata, has found that the embryonic axis is determined either previous to laying or just afterward and cannot be changed by centrifuging. Quiring gives a detailed description of the development of the internal ear of the salt water dogfish, Acanthias vulgaris. The development of the fat body of the frog from a gonad-like primordium has been traced in detail by McKosh. The palatine tonsil in the pig fetus is described by Levin as arising independent of the pharyngeal pouches. Grant, from a study of 50 larval salamanders, has found that metamorphosis is preceded by three distinct morphologic changes, *i.e.*, pigment changes, tail atrophy, and skin shedding. The vestigial oviducts of male frogs of the genus Rana have been found by Christensen to develop after the tests have differentiated, so that the conception that they are present in this genus because of an early bisexual condition (ovo-testis) is contradicted. Altschule describes the changes which take place in the mesonephros of human embryos from 10 to 12 weeks old. By the time the fetus is 42 mm. long there are no intact tubules.

EXPERIMENTS

Irradiation.—Sheard and Higgins have found that hen's eggs exposed to ultra-violet irradiations from air cooled quartz-mercury arcs during incubation will hatch sooner than normally incubated eggs.

Amphibian Metamorphosis. — Under normal environmental conditions certain amphibia such as Axolotl and Necturus, commonly called water salamander, will not metamorphose from water to land forms. They are supposed to lack some fundamental organ which is present in species that metamorphose. Figge assumed this to be the absence of the pulmonary or sixth aortic arch and experimentally produced this condition by ligating the sixth aortic arch in larvae of Amblystoma tigrinum, a salamander which normally metamorphoses. Exposure of operated animals and normal larvae of the same stages of development to metamorphosing substances, such as dessicated thyroid gland, caused metamorphosis of the normals, but not of the experimental animals. Garber, however, attacking the same problem, removed the lungs from axolotls and found that they metamorphosed when treated with dessicated thyroid gland just as did normal controls. From which he concludes that Figge's hypothesis that the "sixth arch is necessary for metamorphosis" is erroneous.

Tissue Transplantation.—Pieces of the gill region of Amblystoma embryos have been found by Severinghaus to produce many diverse structures when removed and transplanted into various regions of the embryonic body. Burr reports that the olfactory primordia of Amblystoma embryos when transplanted into other regions of the head produce ingrowing nerve fibers which cause an increase in the number of nerve cells in that part of the brain which they enter. Twitty transplanted the eyes of larvae of the small amphibian, Amblystoma punctatum, into the larvae of a larger species, A. tigrinum, and observed that although at first there was a discrepancy in the relative rate of growth, subsequently the growth of host and graft tended to be equalized. Stone also reports the results of transplanting the eyes of one of these species into the other. In only two of the experimental animals was there a failure of a connection of the optic nerve with the brain. Kaan observed that the otic vesicle of Amblystoma larvae when transplanted to the region of normal ear formation will stimulate the production of an enveloping cartilaginous capsule, but this will not take place when this vesicle is transplanted to other parts of the body. Adelmann transplanted strips of neural plate of Amblystoma embryos to the abdomen of older larvae and found that they differentiated into eyes.

Nervous System.—Williams has followed the regeneration of medullated nerve fibers in the tails of tadpoles. The nerves were cut and then the region was stained with methylene blue which is specific for living nerve tissue. The nerve distal to the cut region degenerated and the new regenerating nerve gradually grew back into the path of the old nerve. Campenhout reports experimental evidence for the role of the neural crest cells in the production of dorsal root ganglia, sympathetic ganglia and nerves and the chromaffin tissue of the suprarenal glands. He removed the entire neural crest primordium from frog embryos and in the surviving animals found no trace of the above structures.

Circulatory System.—Copenhaver transplanted the posterior parts of the heart of embryos of Amblystoma punctatum into embryos of A. tigrinum and *vice versa.* The transplants fused with the anterior part of the host heart and imposed their rate of beat upon the heart formed by this union. Copenhaver also exchanged the primordia of the whole heart in these species and found that although they may differ in size originally the transplanted hearts gradually assume the size proportions and functional capacities characteristic of the heart of the host.

Endocrine Glands.—Grant implanted the anterior lobe of adult Necturus into the peritoneal cavity of larvae and noted an activation of the thyroid gland as the result of the implantation. In a similar experiment with frogs, Ingram reports hypertrophy of the Golgi apparatus of the cells of the thyroid gland. Corey injected pituitary gland extract into fetal and young rats in order to determine at what age pituitary substance affected changes in the other tissues of the body. Using the gonads as indicators of change Corey found no effect until the 10th postnatal day in males and the 15th in females. Philip Smith removed the anterior lobe of the pituitary body from rats and found that the thymus gland degenerated. He concludes however, that other degenerative changes which follow this experiment, such as inanition, degeneration of gonads, thyroid and suprarenal glands, could also account for the thymic degeneration. Daily homeotransplants of anterior lobe substance restored these animals to a normal condition.

Reproductive System. — Nelson and Haterius transplanted ovaries from non-pregnant rats into pregnant ones in an attempt to find out whether the transplanted ovaries would permit gestation to continue. Gestation continued when ovaries in the diestrous stage of the estrous cycle were used. Burns reports the histologic changes in the gonads of Siamese twins of Amblystoma. He found that usually there is a reversal of sex in the originally female member of experimentally conjoined twins and that this reversal is initiated by degeneration of the primitive ovarian cortex and rapid growth of the rete ovarii. Moore *et al.* castrated rats and then studied histologic changes in the prostate gland and seminal vesicles. These structures degenerated, but could be brought back to their normal state by continued injections of testis extract.

(The above very brief outline attempts to show the trends of investigation in the field of vertebrate zoology. Those interested in more detailed information concerning any of the contributions mentioned may have it by writing to the author of this article.)

INVERTEBRATE ZOOLOGY

By J. A. Dawson

Assistant Professor, The College of the City of New York

PROTOZOA

Metabolism and Growth.—In a continuation of previous work on *Didinium*, C. Dale Beers (*Jour. Exp. Zool.*, Vol. 56, No. 2) shows that encystment may function to increase the vitality of the race when the animals are depressed by inadequate cultural conditions. As previously shown by this author there is no intrinsic life cycle terminating in senescence and this phenomenon is not to be interpreted as a rejuvenative process. E. Fauré-Fremiet (*Biol. Bull.*, Vol. 58, No. 1), working on the problem of growth and differentiation in *Zoothamnium*, finds that the first division of the initial macrozoöid (ciliospore) determines the median plane of the colony and that the following divisions of daughter cells follows a certain pattern which accounts for the main trunk and lateral branches. The smaller daughter cells of microzoöids develop according to a gradient and this unequal power of growth gives the colony as a whole a behavior approaching that of a multicellular organism.

Morphology and Physiology.—H. C. Day (*Physiol. Zool.*, Vol. 3, No. 1) as a result of studies on the contractile vacuoles in *Spirostomum* and *Paramecium*, claims that these are temporary organelles not affected by the presence or absence of a nucleus and functioning primarily as hydrostatic organs. The size, number and rate of pulsation of the vacuoles are increased by placing the organisms in conductivity water. Attacking the problem of the contractile by micrurgical methods Ruth B. Howland (*Jour. Exp. Zool.*, Vol. 55) shows that phenol red injected into the fluid of the contractile vacuole gives a color indicative of a *pH* value of *7.4+.1*. If *Actinosphaerium* is immersed in slightly acidified methyl red this substance penetrates the protoplasm, colors the cytoplasmic granules red and concentrates in the contractile vacuole which then becomes a vivid yellow.

Cytology.—R. P. Hall (*Jour. Morph. and Physiol.*, Vol. 49, No. 1), in a study of the cytoplasmic inclusions of *Trichamoeba* and their reactions to vital dyes and osmic and silver impregnations, shows two types of inclusions which are globular and rodlike or granular respectively. Certain of these inclusions in their reactions to neutral red and osmic and silver impregnation resemble strongly

Golgi material as described for metazoan cells.

Behavior.—W. E. Bullington (*Jour. Exp. Zool.*, Vol. 56, No. 4) contributes a further detailed study of spiralling in members of the genus *Paramecium.* He shows that the following species—*aurelia, caudatum, multimicronucleata, bursaria, woodruffi, polycaryum* and *trichium* characteristically swim in left spirals while a single species—*calkinsi*—spirals to the right. Five of these species, *viz., aurelia, bursaria, calkinsi, woodruffi* and *polycaryum*, are able to spiral in either direction. The author has made an extensive study of the conditions under which the spiralling movements may be reversed and also of the sensitiveness of each species to mechanical stimulation.

Physiology.—Studying the changes in hydrogen-ion concentration in hay and hay-flour infusions of *Paramecium multimicronucleata*, Edgar P. Jones (*Biol. Bull.*, Vol. 59, No. 3) states that this species can live in cultures in which the *pH* varies from 4.83 to 8.31, also that in cultures seeded with 200 paramecia there is an initial increase in acidity which persists for several days followed by a relatively rapid increase in alkalinity. He questions the toxic effect of excretory substances on the paramecia, suggesting that such substances are broken up by bacterial action before becoming sufficiently concentrated to injure the organisms. H. R. Hulpieu (*Jour. Exp. Zool.*, Vol. 56, No. 3) finds that the rate of locomotion in *Amoeba proteus* in an atmosphere of pure nitrogen or hydrogen decreases rapidly, finally becoming zero in from 4 to 6 hours. In an atmosphere containing .005 to 100 per cent oxygen there is not any noticeable effect on amoeba but above or below these limits the result is the same, although more delayed, as when a pure nitrogen or hydrogen atmosphere is used. It is suggested that the energy processes involved in the locomotion of amoeba are similar to those found in the contraction of vertebrate muscle. Working on the relation between the resistance to heat and the mechanism of death in *Paramecium*, H. W. Chalkley (*Physiol. Zool.*, Vol. 3, No. 4) states that in saline solutions of varying *H-ion* concentration at *40° C. Paramecium* varies in its resistance to heat. The curve showing the death points is bimodal with maxima in the alkaline and acid ranges and the minimum at neutrality. The mechanism of death varies according to the conditions, coagulation taking place in solutions of *pH 6.0* or less and disintegration at a *pH of 8.0* or more while in between these ranges death results from rupture of the cell due to swelling. The author suggests an hypothesis to explain these phenomena. Studying the physiological conditions of *Amoeba proteus* at varying hydrogen-ion concentrations Sister M. Eloyse Ellingson (*Proc. Soc. Exp. Biol. and Med.*, Vol. 27, No. 5) claims that excellent or optimal physiological conditions for these species are at a *pH* of from *8.0 to 8.4.* She leaves it an open question, however, as to whether multimodal curves for optimal conditions exist with peaks at successive *pH* levels. Continuing his studies on the effects of toxins and venoms on Protozoa C. H. Philpott (*Jour. Exp. Zool.*, Vol. 56, No. 2) shows that botulinus toxin, tetanus toxin and ricin had no effect on *Paramecium caudatum.* There is a wide range of susceptibility to *Crotalus atrox* venom among eleven representative species of protozoa. *Paramecium* is susceptible to destructive action of different agents in the various venoms investigated. An unusual degree of success hitherto not obtained by other investigators in the culture of cattle ciliates was experienced by Sidney Margolin (*Biol. Bull.*, Vol. 59, No. 3). The author found most successful a culture medium composed of hay infusion, saline citrate, rice starch, magnesium oxide and cellulose in the form of filter paper. He suggests that a symbiotic state exists between the bacteria and ciliates present in the rumen of cattle and that the bacteria hydrolyze the cellulose for use by the ciliates.

METAZOA

Morphology and Development.—A study of the natural history of Bugula flabellata at Woods Hole, Mass., is made by B. H. Grave (*Jour. Morph. and Physiol.*, Vol. 49, No. 2), who finds that the breeding season is from June 10 to Nov. 15. The young embryos have a free swimming period of from 4 to 6 hours and are at first positive and later negative to light. Observations on the rate of growth and viability of colonies are given. H. W. Stunkard (*Jour. Morph. and Physiol.*, Vol. 50, No. 1) gives a very complete and illuminating account of the life history of the trematode *Cryptocotyle lingua.* He shows conclusively by studying every stage in the life history that the invertebrate host is *Littorina litorea* and the vertebrate hosts are fish-eating mammals. Evidence is presented showing that the cercaria of this species is identical with *Cercaria lophocerca* described from the same snail on the British coast. Spontaneous fragmentation in two species of the nemertean *Lineus* is described by W. R. Coe (*Physiol. Zool.*, Vol. 3, No. 3). This asexual method of reproduction is presumably a normal happening in the life cycle of this genus and occurs most frequently during the summer months. Large specimens tend to fragment more readily as a rule than smaller ones. Correlated with this autotomy there is also a great regenerative capacity. The presence of a lymph system, hitherto unknown, in two families of digenetic trematodes is demonstrated by C. H. Willey (*Jour. Morph. and Physiol.*, Vol. 49, No. 1). The significance of this system as bearing on the origin of different types of trematodes is stressed. Corroborating by a morphological study certain facts revealed in the earlier physiological study of the color changes in *Palaemonetes* by the junior author, M. S. Brody and E. B. Perkins (*Jour. Morph. and Physiol.*, Vol. 50, No. 1) demonstrates that *Palaemonetes* has a degenerate ventral abdominal artery and a ventral continuation of the dorsal abdominal artery is thus distributed to practically the entire abdomen and is responsible for the color change phenomena in the abdomen. The authors also describe a method for injecting the arteries of small crustaceans. A peculiar new marine annelid, *Poebius meseres,* family *Poeobiidae,* described by Harold Heath (*Jour. Morph. and Physiol.*, Vol. 49, No. 1), shows characters making it a connecting link between the *Annelida* and *Echiuroidea.* In a study of the morphological characters of nematodes of the genus *Rhabditis*, B. G. Chitwood (*Jour. Morph. and Physiol.*, Vol. 49, No. 1) finds that the amphids are not excretory but more probably excretory in function. The phasmids also were never observed to excrete. Various other structural features of the genus are described. A careful study of the mechanics of migration of the distal pigment cells in the eyes of *Palaemonetes* by John H. Welsh (*Jour. Exp. Zool.*, Vol. 56, No. 4) reveals that the migration of these cells is brought about by a contractile fibre system. At the proximal end of the pigment cells these fibres are continuous with the nuclei of the retinular cells. V. Earl Light (*Jour. Morph. & Physiol.*, Vol. 49, No. 1), investigating the photoreceptors in *Mya arenaria,* finds special cells on the siphons equipped with a lens and supplied with nervous connections which are very similar to the visual cells of leeches and the photoreceptors of the earthworm. Correlating the sensitivity to light of different parts of the siphon with the presence of these cells, he shows them to act as photoreceptors. B. G. Andrews and L. A. Brown (*Physiol. Zool.*, Vol. 3, No. 3) present the results of a study of chitin secretion in *Daphnia magna.* An experimental method was developed for determining the time of secretion of chitin and it was found that, in adult instars of *Daphnia,* chitin is secreted when 60 per cent of the instar period has been passed and also that between the temperatures of 15° and 25° C. the time at which secretion begins is a function of the temperature.

Ecology.—In a study of the relationships between ants and aphids in respect to the production of "honeydew" by the latter, E. A. Andrews (*Physiol. Zool.*, Vol. 3, No. 4) finds that aphids may project the fluid violently without external stimuli but that with gentle mechanical stimulus it is presented in the form of drops. He suggests that the relationship between these insects has been developed by the adjustments of the aphids' reflexes to respond to the slight mechanical stimulus afforded by the stroking of the ant; the ants on the other hand being attracted to the aphids by stimulation arising from their secretions. The results of a combined study by W. C. Allee, M. M. Torick, J. P. Loeb and P. L. Hollister show that the usual characteristics of soil in which earthworms will live are medium texture, abundance of organic matter, constant moisture, good aeration and a neutral or very slightly alkaline reaction. The *pH* alone is not responsible for the presence of earthworms as they have been found in soils ranging from *pH 5.6-8.3*; they are most abundant, however, in soils ranging from *pH 7.0-7.8*.

Cytology and Histology.—The spinning glands of the larva of the Bee moth (*Galleria mellonella*) have been studied by Chao-fa Wu (*Jour. Morph. and Physiol.*, Vol. 49, No. 1) who reports that the function of the mitochondria and of the Golgi apparatus in secretion is negligible. According to this author the nucleus gives off bodies (*nucleoli*) into the cytoplasm which are functionally active in the secretory process. In the hermaphroditic gland of the snail, *Polygyra appressa* according to Miriam I. Pennypacker (*Jour. Morph. and Physiol.*, Vol. 49, No. 2) the female germ cells develop in the acinus wall while the male germ cells develop in the lumen. The spermatogonial chromosome number is from 61-63, that of the spermatocytes and oocytes is 31. A. W. Pollister (*Jour. Morph. and Physiol.*, Vol. 49, No. 2) working on cytoplasmic phenomena in the spermatogenesis of the water strider (*Gerris*) shows that the chondriosomes increase greatly during this process and that the nebenkern arises by fusion of these elements which are differentiated into staining and no staining portions. The Golgi bodi are vesicular with the outer pa staining with osmic acid. He al suggests strongly that the acrosome formed within the Golgi apparatu The kinds and the nature of the bloc cells of Bermuda ascidians are d scribed and classified by W. C. Geor (*Jour. Morph. and Physiol.*, Vol. 4 No. 2) for four species. In gener these cells are grouped as vacuolat or non-vacuolated. The relationshi of the various pigmented types a discussed.

Physiology.—The effect of temper ture on the chromatophores of *Macr brachium acanthurus*, a Cuba shrimp, is reported by Dietrich Smith (*Biol. Bull.*, Vol. 58, No. 2 who finds that immersion in water any temperature between 6° and 1 C or between 35° and 40° is followe by expansion of the chromatophore this reaction occurring regardless the background upon which t shrimp is placed. If the shrimps a chloretonized or blinded the chrom tophores are expanded and this co dition is not altered by changes temperature or background. Harol J. Eigenbrodt working with a hom zygous race of Drosophila shows th the body weight varies inversely the temperature at which the fli are raised. The males are consis ently lighter than the females. The is less sexual dimorphism in all si measurements at low temperatur than at high temperatures. Th there is a critical temperature which the vestigial wings in *Dros phila* lengthen has been found by Mo ris H. Harnley (*Jour. Exp. Zoo* Vol. 58, No. 2). This critical tem erature lies between 29° and 30° in males and at 31° C in females. also finds in general that the muta gene for vestigial wings in *Drosop ila* has varied morphological an physiological effects. H. Federig (*Jour. Exp. Zool.*, Vol. 56, No. 4 shows that the temperature chara teristics for the frequency of puls tion of the dorsal blood vessel *Nereis virens* gives values for μ 83,000, 11,400, 13,700, 16,400, 21,9 and 24,300 calories and that the agree with those reported for various activities of other animals. There are two critical temperatures at 10° and at 13° C both of which have been noted previously for biological processes in other animals. Studying the effect of exposure to cold on the embryonic development of the Japanese Beetle, Daniel Ludwig (*Physiol. Zool.*, Vol. 3, No. 3) finds that eggs subjected immediately after being laid to a temperature of 10° C for one month are retarded in subsequent development at constant high temperatures. There are changes of a rhythmic nature in susceptibility to low temperature during embryonic development. By immersing *Arbacia* eggs in solutions of potassium cyanide and also by microinjection of the same substance, Floyd J. Brinley (*Physiol. Zool.*, Vol. 3, No. 3) demonstrates the anaesthetic action of this compound on the plasma membrane. He suggests that the effect on the membrane may be due to the combination of the cyanide with some constituent of the membrane. Leland C. Wyman and Brenton R. Lutz note in the action of adrenaline and various other drugs (*Jour. Exp. Zool.*, Vol. 57, No. 3) on the isolated holothurian cloaca apparent similarity with the action of the same drugs on the mammalian intestine. They refuse, however, in the absence of adequate morphological data to draw conclusions as to the neuromuscular mechanism in the holothurians. In the eggs of the grasshopper, *Melanoplus*, Eleanor H. Slifer (*Physiol. Zool.*, Vol. 3, No. 4) finds that new laid eggs have twice as great a quantity of the higher fatty acids than at hatching, thus supporting Needham's theory that the eggs of terrestrial animals utilize, in development, fats rather than proteins. Reuben Blumenthal (*Physiol. Zool.*, Vol. 3, No. 4) concludes from a study of the effect of cyanides on the mitotic development of *Arbacia* eggs that mitosis is not directly dependent on oxygen availability and that the final inhibition of mitosis in potassium cyanide may be due to some secondary effect of the cyanide. Mitosis apparently is brought about by a process similar to that which operates in ameboid movement and muscular contraction. In an extensive study of the neutral red reaction in many different types of organisms Vera Koehring (*Jour. Morph. and Physiol.*, Vol. 49, No. 1) maintains that neutral red is an indicator of proteolytic enzyme action and that the hydrolytic and synthetic processes in cells can be followed by using this dye. Olga T. Hess (*Physiol. Zool.*, Vol. 3, No. 1) working with the effects of pure solutions of Sodium, Potassium and Calcium chlorides on *Planaria dorotocephala* finds that the Calcium chloride is least toxic and the Potassium chloride is most toxic The great tolerance of this *Planaria* to Calcium chloride is explained on the basis of the high proportion of the salt present in the natural environment of the worm. A. M. Banta *Physiol. Zool.*, Vol. 3, No. 1) in a continuation of long-extended studies on control of sex in certain Cladocera finds that various drugs as chloretone, potassium cyanide, phenyl and methyl urethane when present in certain concentrations which he designates as "heavy" bring about an increase in the number of males produced. When *Arbacia* eggs are treated with mercuric chloride, Leigh Hoadley (*Biol. Bull.*, Vol. 58, No. 2) reports a different effect from that of any other metallic chloride previously investigated. Treated with this substance the egg pigment reacts by accumulating and is subquently extruded at localized points on the surface of the egg. The development of the zygote is retarded and the viability lowered by the action of mercuric solution. In a study on respiration in *Planaria* with a modified Warburg manometer, M. Fraps (*Physiol. Zool.*, Vol. 3, No. 2) making use of experimental solutions, based on the salt concentrations of the spring water in which Planaria lives, finds that the initial Calcium-Potassium ratio is high and that changed concentrations of these substances in the same ratio are without effect on the rate of oxygen consumption. In *Simocephalus* during developmental stages the oxygen consumption has been studied by V. Obreshkove (*Physiol. Zool.*, Vol. 3, No. 2) who states that there is a continuous decrease in metabolic rate which is more marked in the later brood mother stages than in any of the instar stages. In further studies by the same author and A. M. Banta (*Physiol. Zool.*, Vol. 3, No. 1) on different clones of Simocephalus derived originally from a single mother a physiological mutation in one clone is reported. The mutant animals show an oxygen consumption which is only about half as great as that of representatives of the other clones. Brenton R. Lutz (*Biol. Bull.*, Vol. 58, No. 1) investigating the effect of low oxygen tension on the pulsations of the isolated holothurian cloaca gets evidence to support the view that decreased oxygen tension results at first in increased activity of muscular and nervous tissues. The effects of acids and bases on the respiration of tapeworms was investigated by S. F. Cook and F. E. Sherman (*Physiol. Zool.*, Vol. 3, No. 1). These authors find that different acids of the same *pH* have the same effect on respiration showing that the *H-ion* is the effective agent. Hoyt S. Hopkins (*Jour. Exp. Zool.*, Vol. 56, No. 2) studying the respiration of muscle tissues of molluscs in relation to age differences shows that there is a falling off in oxygen consumption with increasing age. The rate of respiration is greater in the closing muscle of the scallop which is striated than in the so-called "catch" muscle which is non-striated. The author also gives a curve of growth for *Venus mercenaria* at Beaufort, N. C., based on the study of seasonal rings of growth on the shell. The relation between luminous intensity and the length of the refractory period in the eye of the Drone fly (*Eristalix tenax*) was studied by William L. Dolley (*Jour. Exp. Zool.*, Vol. 56, No. 2) who finds that the length of the refractory period depends on the luminous intensity and is longer in dim light than in bright light. L. V. Heilbrunn and R. A. Young (*Physiol. Zool*, Vol. 3, No. 3) have found that application of ultra violet rays on the protoplasm of Arbacia eggs is ineffective in the absence of Calcium. In presence of Calcium, stimulated eggs invariabl show an increase in the viscosity o the protoplasm.

Polarity and Regeneration.— Studies in this field are carried o chiefly by Dr. C. M. Child and hi students. Dr. Child in an extensiv paper (*Physiol. Zool.*, Vol. 3, No. 1) on the susceptibility of Planaria t Potassium cyanide in relation to th hydrion and salt concentration of th medium finds a difference in susceptibility in the long axis which is interpreted as showing a quantitativ physiological differential. He als finds differences in susceptibility i the transverse plane which he interprets similarly. The same autho and K. M. Beyer (*Physiol. Zool.*, Vol 3, No. 3) show that, in the reconstitution of lateral pieces of *Planaria* varying fractions from one half t one sixth of the anterior and wil regenerate anterior ends in nearly al cases. The same fractional pieces o the anterior zooid from regions latera to the longitudinal nerve cords show a high regenerative frequency. Evidence is given to show that the Nervous System plays a part in the localization of the regenerated head. A antero-posterior gradient in the disintegration of *Planaria* at hig temperatures is found by J. W Buchanan (*Jour. Exp. Zool.*, Vol. 57 No. 3). The effect of the Nervous System in regeneration of the earthworm, *Eisenia*, has been studied b P. L. Bailey (*Jour. Exp. Zool.*, Vol 57. No. 3) who finds that when th nerve cord is cut in the mid part o the worm and both ends looped bac no regeneration of the fibres take place and in the anterior half of worm so treated no regeneration o the posterior end takes place. In repetition of the earlier classical experiments of the senior author o regeneration in *Microciona*, H. V Wilson and J. T. Penney make careful analysis of the types of cell which are found in suspensions o the sponge cells which have bee passed through fine bolting cloth They state that the outer surface o this sponge is covered by a continuou syncytial sheet of protoplasm formin an epithelioid membrane.

Experimental Embryology.—The experimental production of double embryos in certain annelids and molluscs is reported by A. Tyler (*Jour. Exp. Zool.*, Vol. 57, No. 3). Pressure, low temperature, centrifuging and anaerobiosis were effective in producing such embryos. T. H. Morgan and A. Tyler (*Biol. Bull.*, Vol. 58, No. 1) studying the relation of the point of entrance of the sperm to the orientation of the embryo find that in 78 per cent of the cases in *Cumingia* the cleavage plane very nearly coincides with the entrance point of the sperm. In *Chaetopterus* the second cleavage plane coincides with the median plane of the body although sometimes the entrance point of the sperm is to the right and sometimes to the left of the median plane.

Genetics.—In genetic studies on *Stenostomum incaudatum*, T. M. Sonneborn (*Jour. Exp. Zool.*, Vol. 57, No. 3) reports that treatment with lead acetate produces no appreciable effects on single individuals during their lifetime but that lines of successive offspring become abnormal in less than ten generations, *i.e.*, there is a cumulative effect of lead acetate on the offspring. If returned to normal environment the abnormalities disappeared but in two cases double individuals were produced which gave rise to two new races each with constant characteristics neither of which reverted to normal. Warren P. Spencer (*Jour. Exp. Zool.*, Vol. 56, No. 2) reports the origin of a new mosaic eye color in Drosophila hydei. The character is sex-limited and behaves in breeding experiments as if it were a recessive autosomal modifier of vermilion.

VERTEBRATE PALEONTOLOGY

By Frederic B. Loomis

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GENERAL

Vertebrate palaeontology is struggling to piece together a clear picture of the higher animal life from the time that the ancestral fish began actively swimming in the sea, down to the time man assumed dominance. During the many millions of years that vertebrate life has teemed in the water, on the land, and in the air only a few of the myriads of animals have left any trace of their former existence, the few which died in a place and at a time suitable for their preservation. The circumstances under which the bones of vertebrates are preserved are exceptional. In the sea it is where quantities of mud are being deposited and at the same time the water is quiet. On the land it is where the bones are soon buried below a water seal, which will prevent oxidation of the air, and repeated expansion and contraction of changing temperatures. This is usually in a bog or under the flood plains of mature rivers where the underground water is very near the surface. Our picture must be made by placing in their proper position the few individuals of the past which come to us, often in fragments. Year by year new forms are discovered, and after being studied are placed as nearly as possible where they belong. Already the picture is intelligible in outline, though there are places in it which are vague, but each year sees more animals completely known, more new forms found, and more studies of individual groups, and their times.

DISCOVERY

Gobi Desert.—The past year has seen a net thrown to most parts of the globe, and the catch has been generous. The American Museum of New York came to an understanding with the Chinese Cultural Society and has again had a party in the Gobi Desert, which reports goodly finds, especially of the new type of mastodons, the shovel-toothed mastodens, which have lower tusks flattened out into broad flat digging blades. They report several skulls, and all parts of the skeleton, though disassociated, of both young and old individuals.

Nebraska.—Curiously while the Gobi is yielding these "Amebelodon" mastodons, the University of Nebraska has been finding the same sort of shovel-tusked mastodons in large numbers in the state of Nebraska. They too have large quantities of material. Nebraska yielded to the state museum skeletons of mammoth, the normal mastodon, early horse, and a tiny deer. The Colorado Museum also gathered from Nebraska skeletons of the slender little camel, Stenomylus, the mammoth, and an early rhinoceros.

South America and Africa.—The American Museum also has a party in southern Argentine, getting more of the early tertiary aberrant life peculiar to South America through most of the Tertiary. The University of Michigan is still gathering early reptile material on South Africa, to supplement the collections already in this country.

Canada.—Efforts have been especially to get more of the dinosaurs of the western provinces. The Victoria Museum of Ottawa worked along the Peace River and found there a new locality for dinosaur tracks, of which they made a considerable collection. They also gathered some more and apparently new Ichthyosaurs, sea reptiles. From the Red River region of Alberta the Royal Ontario Museum of Toronto brought in more of those remarkably preserved dinosaurs of which they are getting a collection second only to that in New York.

Wyoming and Montana.—From the Bridger Basin in Wyoming the National Museum at Washington brought skeletons of the primitive rhinoceros Hyrachyus, and the early horse, Orohippus, not to mention 35 turtles, and 9 crocodile skulls of types which lived in the fresh water of this region in the Eocene time. Not far off in the Wasatch Mountains the University of Missouri was getting series of new fishes from the mor remote Devonian period. Princeto University has been gathering in collection of the minute, and earl mammals in Wyoming and Montana and was peculiarly fortunate in finding some broken shells, which ar identified as the egg shells of dinosaurs, the first to be found anywher but in the Gobi Desert.

Arizona and Texas.—Texas yielded to the University of Michiga more new Permian reptiles, and als new amphibians of the Stegocephalian type. In the Triassic of Arizon the American Museum party sifte out the fragments of a skeleton of new reptile which appears to be ancestral to the dinosaurs, and thos crocodile-like Phytosaurs.

Great Lakes.—An unexpected fin was that of whales on the shore o Lake Michigan, individuals whic had entered the Great Lakes when just after the ice age, they wer broadly connected with the ocean.

China.—Probably the most important find was made Dec. 2, 1929 by a young Chinese, Mr. Pei, whe he discovered a skull and part of th skeleton of a man, associated wit the remains of many extinct animals This was some 40 miles southwest o Peking, at a locality where huma teeth had been previously found. Thi skull, termed the Peiping man, seem to be about as old as the Piltdown o Java men, *i.e.* about the beginning o the ice age. It, however, has severa characters which approach those o more recent man and does not appea as primitive as does Neanderthal ma of a much later date. The skull i being prepared and studied, afte which more definite statements can b made.

MOUNTING AND PLACING SPECIMEN

Dinosaurs.—On the side of making newly discovered material available for all to examine and study, th various museums are mounting an placing on exhibition their mos striking and suggestive specimens Among the specimens of especial not this year are two great dinosaurs the one Brontosaurus, on exhibitio at Yale University, the other Diplodocus at the National Museum. Some 25 years ago, two similar dinosaurs were prepared, and mounted at the American Museum in New York and at the Carnegie Museum in Pittsburgh, and these are the next ones of that group which measures from 70 to 80 feet long. Several smaller dinosaurs have been completed this year, Archiceratops, at Toronto, and the duck-billed dinosaur, Corythosaurus, at Ottawa, and a giant Triceratops skull at Amherst College.

Reptiles.—The American Museum is showing its giant turtle, Collocochelys, from India. The University of Kansas has two new mounts of Platycarpus, a large one and a small one, and the University has shown its curious early reptile, Ostedolepis.

Mammals.—There are many new mounts of mammals, of the horse, rhinoceros, deer, titanothere, etc., families, but only three will be mentioned. Princeton has mounted the first skeleton of a curious herbivor, Adinotherium. Yale has put on exhibition its curious ground sloth from the cave in Texas, and the South Dakota School of Mines mounted a skeleton of Merycoidon which contains an embryo skeleton in it, which shows that the wide variations in this genus are not due to sex, but are individual.

STUDIES

During the year an unusually large number of studies have been completed. H. C. Stetson gives a new study of the gigantic fish Dinicthys, which is so peculiar in having jaws, which, however, do not homologise with those of living fish. A. S. Romer restudied the earliest amphibians, those of Pennsylvanian age, and has given us restorations of the skulls as far as known of these earliest of land animals. Branson and Mehl presented us with descriptions of their most remarkably preserved Triassic amphibia, all Stegocephalia. Among the reptiles C. L. Samp has described and considered the relationships of the superb crocodile-like Phytosaurs which he has been collecting for eight years from the Triassic of South West United States. E. C. Case adds another completed form to the many we have gradually acquired from the Texas Permian, Ostodolepis, a very primitive as well as early reptile. Several new dinosaurs have been described, the most interesting a new bird-like small Struthiominus from Alberta.

Among the mammals, outstanding new forms are Lull's remarkable ground sloth, Northrotherium, and W. D. Matthew and Stirtan's big bull dog, Borophragus, which lived in the Texas region during the early Pliocene. A census of the mamals trapped in the unusual tar pits of Pliocene age at Los Angeles shows that, of over 4,000 individuals dying there, 91 per cent were carnivors,—wolves and sabre-toothed cats,—the remaining 9 per cent being distributed between horses, bison, camels, elephants and ground sloths, a remarkable assemblage when it is remembered that there are usually a hundred herbivors to each carnivor. Similarly among the birds here preserved in almost equal number, the hawks and eagles dominate, followed closely by the vultures. The first descriptions of the shovel-tusked elephants have been distributed by E. H. Barbour. However the big event of the year was the appearance of H. F. Osborn's monograph of the Titanotheres of Ancient Wyoming, Dakota and Nebraska, in which this family is fully described and illustrated, a family of large herbivors of bison-like stature, but of rhinoceros affinities, divided into 20 phyla, with 24 genera and 97 species, all living in the relatively short time from late Eocene to the middle of the Oligocene, when they disappear as though exterminated by a plague. They are dominantly American, but from time to time, a few got over to Mongolia, and across Asia as far as Bohemia in Europe. This is a magnificent work, in two large quarto volumes with 236 plates and almost 800 figures, the result of nearly 50 years of effort, begun by Cope and continued and greatly amplified in scope by Osborn. It considers, not only descriptions of all titanotheres, but their origin, development and extinction.

XXII. BIOLOGICAL SCIENCES

BOTANY

By Mildred E. Mathias

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BOTANICAL SOCIETIES

International Congress. — The Fifth International Botanical Congress at Cambridge, England, during the past summer, was the focal point of botanical interest in this country as well as abroad. American botanists were represented at the meeting by numerous workers, many of whom spent the early summer in research in European centers before attending the Congress. The attention of the Congress was primarily focused on the legislation concerning nomenclature.

Botanical Society of America.—The annual meeting of the Botanical Society of America was held in conjunction with the American Association for the Advancement of Science at Cleveland in late December. As usual there were many sessions where papers of general interest were presented, and some time was devoted to a discussion of the proceeding of the International Congress. Continuing the precedent set in the summer of 1929 the Botanical Society of America held a summer meeting at the Puget Sound Biological Station, Friday Harbor, Washington. This meeting was of particular interest to west coast botanists.

Cinchona Congress.—A congress of more limited interest was the Cinchona Congress held at the Missouri Botanical Garden in the fall celebrating the 300th anniversary of the discovery of *Cinchona* as a cure for malaria.

PLANT PHYSIOLOGY

Light and Radiation.—This subject has continued to be one of much importance. The knowledge of the effects of ultra-violet and infra-red radiation upon plants has been furthered by such contributions as the following: Adelia McCrea, "Prolonged effect on Digitalis purpurea of exposure under ultra-violet-transmitting glass"; C. Sheard and A. Frances Johnson, "The effects of infra-red, visible and ultra-violet irradiation changes in electrical potentials a currents in plants"; and G. B. Ra sey and Alice A. Bailey, "Effects ultra-violet radiation upon sporul tion in *Macrosporium* and *Fusarium* a paper of interest to the mycologi In a paper by Sheard, Higgins a Foster, "The germination of seed growth of plants and development chlorophyll as influenced by selecti solar irradiation", the conclusion reached that ultra-violet and infr red irradiation stimulate germinati and enhance growth and developme but that the development of chlor phyll is enhanced under the yello ish-green, green and greenish-blue r gions of the spectrum, least under t ultra-violet and infra-red.

Study of X-ray effects has be mostly limited to the field of gen tics but one note on the subject, n essentially genetical, is the paper Clark, Lucy W. Pickett and Mr Farr entitled "Some practical resul of an X-ray analysis of cotton fibers

Electrical potentials in plan have been studied by several ou standing workers in the field. L. Blinks has published three parts of t a paper entitled "The variation electrical resistance with applied p tential," working primarily wi *Valonia*. Osterhout has presented tw papers, one on *Nitella* "Calculation bioelectric potentials I. Effects KCl and NaCl on Nitella"; the oth on Valonia, published jointly wi E. B. Damon, "The concentration fect with Valonia: potential diffe ences with concentrated and dilut sea water."

Growth and Nutrition.—This su ject is always one of interest to t plant physiologist. The results researches have been published many workers, among the numero contributions such papers as the fo lowing may be mentioned as indic tive of the varied and widespre studies: Miss Reid on "Growth a nitrogen metabolism of squash see lings;" Macht, "A study of twenty-three octyl alcohols on growth of Lupinus seedlings;" a paper by Hopkins on "Iron-ion concentration in relation to growth and other biological processes;" Mack, "The relation of temperature and the partial pressure of oxygen to respiration and growth in germinating wheat;" Haas, "Boron as an essential for healthy growth of Citrus;" Johnston and Fisher, "The essential nature of boron to the growth and fruiting of the tomato;" Clark and Fly, "The role of manganese in the nutrition of Lemna;" and Powers, "The role of sulfur in plant nutrition."

Dormancy and Germination.—Studies have been continued by many but primarily by the workers at Boyce Thompson Institute with papers by Barton, Denny, W. E. Davis and others.

Tobacco Mosaic Virus.—Papers of interest are one by Takahashi and Rawlins, "Electrophoresis of tobacco mosaic virus;" Price, "Local lesions on bean leaves inoculated with tobacco mosaic virus;" and Holmes, "Local and systematic increase of tobacco mosaic virus."

Energy Emanation.—Borodin has published a paper of value both to the cytologist and physiologist on "Energy emanation during cell division processes."

Miscellaneous.—Papers in other phases of the subject indicating the wide range of activity are one by Kurz on "The relation of *pH* to plant distribution in nature;" Harvey, "Time and temperature factors in hardening plants" in which it is suggested that hardiness in plants is a cold shock response; Clements, "Hourly variations in carbohydrate content of leaves and petioles;" Gerhart, "Respiration in strawberry fruits;" McNair, "The taxonomic and climatic distribution of oil and starch in seeds in relation to the physical and chemical properties of both substances" and "Gum, tannin, and resin in relation to specificity, environment, and function;" and Esther M. Mitchell, "A microchemical study of hemicelluloses of endosperms and cotyledons." A paper of practical value to the floriculturist is one by Thornton on "The use of carbon dioxid for prolonging the life of cut flowers, with special reference to roses." One text in plant physiology which may be mentioned here is that by R. B. Harvey of the Minnesota Agricultural Experiment Station on "Plant Physiological Chemistry." This brief discussion gives some indication of the range of activity in the field of plant physiology and the phases which dominate the literature for the year.

MORPHOLOGY AND ANATOMY

Pollen Grains.—Several series of researches have been continued with additional publications, as for example Wodehouse's work on pollen grains, particularly in the identification and classification of plants and Johansen's "Studies on the morphology of the Onagraceae."

Inflorescence and Fruit.—The knowledge of the morphology and anatomy of inflorescence and fruit has been added to by several papers, among which may be mentioned the following: Hettie M. Chute, "The morphology and anatomy of the achene;" Eames and Wilson, "Crucifer carpels", in which they present their views in opposition to the theory of carpel polymorphism; Lucy E. Boothroyd, "The morphology and anatomy of the inflorescence and flower of the Platanaceae;" "Conifer infloresence" by Wieland; a paper by Leffingwell, "Morphological study of bulb and flowers of Cammassia quamash (Pursh) Greene;" and Woodson's "Studies in the Apocynaceae I" which gives a detailed treatment of the anatomy of the apocynaceous flower.

Wood Anatomy.—Frost has begun a series of papers under the general title of "Specialization in secondary xylem of Dicotyledons." Two papers concerning woody anatomy are those by Kribs on the "Comparative anatomy of the woods of the Meliaceae" and Kienholz on "The wood structure of a 'pistol-butted' mountain hemlock." Sinnot has published a paper on "The morphogenetic relationships between cell and organ in the petiole of Acer."

Lower Forms.—Among publications on the morphology of lower forms, Sealey's paper on "The Morphology of Oxymitra androgyna", Sister Mary Ellen O'Hanlon's study of "Gametophyte development in Reboulia hemisphaerica" and Bartoo's work on the "Origin of tissues of Shizaea pusilla" may be mentioned.

Other Researches.—Other papers indicating the variety of researches are Miss Stokey's study of the "Prothallia of the Cycatheaceae"; Betty Long's paper on the "Spikelets of Johnson Grass and Sudan Grass"; two papers by Skutch "On the development and morphology of the Leaf of the Banana" and "Repeated fission of stem and root in Mertensia Maritima—a Study in Ecological Anatomy"; Navez's publication "On the distribution of tabular roots in Ceiba"; "Comparative anatomy and morphology of embryos and seedlings of maize, oats, and wheat," by Avery; and "Development of the ovule and embryo sac of Alfalfa," by R. G. Reeves.

TAXONOMY

Explorations.—M. E. Jones has continued his collecting activity with an expedition through the southwest and lower California. P. A. Munz and his students, together with Mr. Hoffmann of the Santa Barbara Museum, have advanced knowledge of the flora of the islands off the southern California coast. C. L. Hitchcock and G. J. Goodman made a general collection through the western states during the summer. Numerous other comparatively local collections have been made in various parts of the country. These together with a large amount of South American material, collected on recent expeditions and by individuals in that continent, have greatly augmented the present collections of the country.

Publications.—Papers of interest from the Gray Herbarium of Harvard University are a continuation of Johnston's "Studies in the Boraginaceae" and a monographic treatment of "The Stevias of North America" by Dr. Robinson. Rydberg at the New York Botanical Garden has continued the publication of "Genera of North American Fabaceae" and Gleason of the same institution his "Studies on the flora of northern South America." Dr. Pennell of the Academy of Natural Science, Philadelphia, has published an additional treatment of "Agalinis and allies in North America." Contributions from the United States National Herbarium include a paper by Trelease on "The Piperaceae of Costa Rica" and Hitchcock's work on "The Grasses of Central America." Sherff has continued his studies on "New or otherwise noteworthy Compositae." Two taxonomic papers issued from the Missouri Botanical Garden are Woodson's "Studies in the Apocynaceae I. A Critical Study of the Apocynoideae," a series of which numbers II and III had previously appeared and "Studies in the Umbelliferae III," a monographic treatment of *Cymopterus* and related genera, by Miss Mathias. Dr. Munz of Pomona College has continued publication of his studies in the *Onagraceae* and our knowledge of this family has been added to also by a paper by Hitchcock working at the same institution, "Revision of North American Species of Godetia." The contributions from the Dudley Herbarium of Stanford University include McMinn's paper on "A Geographic and Taxonomic Study of the California Species of the Genus Ceanothus."

Floras, manuals and plant lists always form a large portion of the taxonomic literature. One of the most outstanding works to appear during the past year is the volume on "Northern Rocky Mountain trees and shrubs," by the late Dr. J. E. Kirkwood of the University of Montana. St. John and Miss Hardin have published a "Flora of Mt. Baker"; Fogg has begun a series on "The flora of the Elizabeth Islands, Massachusetts." Other works to be mentioned are Standley's "Flora of Yucatan"; Peattie, "Flora of the Indiana Dunes"; and McAtee's supplement to the flora of the District of Columbia. Two plant lists which may be cited are Jeffs and Little, "A preliminary list of the ferns and seed plants of Oklahoma" and Hoffman, *et al*, "Cacti and other succulents," an annotated list of the plants in the region of Santa Barbara, California. Taxonomic publications concerning the lower plants include G. N. Jones' "Moss Flora of Southeastern Washington"; Tiffany's "The Oedogoniaceae," a systematic treatment which will doubtless become a standard reference work; two papers on marine algae by W. R. Taylor; the description of a new genus of the Cladophoraceae, *Basicladia*, by W. E. Hoffmann and Josephine E. Tilden; and a paper by H. J. Brown on "The desmids of the southeastern coastal plain region of United States."

MYCOLOGY

Two outstanding works which have appeared during the year are Thom's "The Penicillia" and Fitzpatrick's "The lower fungi: Phycomycetes." Both works give taxonomic treatments and are valuable to the student as general references. Kaufmann has published an extensive treatment of "The fungous flora of the Siskiyou mountains in southern Oregon." The literature concerning the genus *Fusarium* has been increased by papers by Henry on the "Inheritance of immunity from flax rust" and by J. C. Walker on "Inheritance of Fusarium resistance in cabbage." The cytological knowledge of the fungi has been added to by the following papers: Edith Stevens, "Cytological features on the life history of Gymnosporangium Juniperi-Virginianae"; Miss Allen, "A cytological study of heterothallism in Puccinia graminis"; Levine, "The chromosome-number in cancer tissue of man, of rodent, of bird and in crown gall tissue of plants"; and three papers by Cotner, "Cytological study of the zoöspores of Bastocladia," "The cytology of cilia formation in the swarm-spores of Myxomycetes" and "The development of the zoöspores in the oömycetes at optimum temperatures and the cytology of their active stages."

CYTOLOGY

Among publications in pure cytology may be listed Woodworth's continuation of a series of "Cytological studies in the Betulaceae"; Longley and Sando, "Nuclear divisions in the pollen mother cells of Triticum, Aegilops, and Secale and their hybrids"; Sara F. Passmore, "Microsporogenesis in the Cucurbitaceae"; and Reeves, "Nuclear and cytoplasmic division in the microsporogenesis of Alfalfa." Two papers concerning lower groups are by Spessard on "Fertilization in a living Oedogonium" and Ophelia C. Wesley, "Spermatogenesis in Coloechaete scutata." Chromosome studies have been continued by Sax with a paper on "Chromosome stability in the genus Rhododendron" and Miss Lindsay on the chromosomes of dioecious Angiosperms.

GENETICS

Stadler's paper on "Some genetic effects of *x-rays* in plants" and two papers by East on "The origin of the plants of maternal type occurring in connection with interspecific hybridizations" and "The production of homozygotes through induced parthenogensis." Mrs. Erlanson has continued the study of the genus *Rosa* with papers of interest to workers in other fields as well as in genetics. The genera *Datura* and *Oenothera* remain material for extensive genetical study. Our knowledge of these two genera has been advanced by the following papers: Buchholz and Blakeslee, "Pollen-tube growth of the primary mutant of Datura, Rolled, and its two secondaries"; Blakeslee and Cleland, "Circle formation in Datura and Oenothera" "Interaction between complexes as evidence for segmental interchange in Oenothera"; and Sturtevant and Dobzhansky, "Reciprocal translocations in Drosophila and their bearing on Oenothera cytology and genetics." *Crepis* and *Nicotiana* also furnish material for genetical studies, with the following publications concerning these genera: Hollingshead, "A lethal factor in Crepis effective only in an interspecific hybrid";

Navashin, "Unbalanced somatic chromosomal variation in Crepis"; and two papers by Goodspeed, "Inheritance in Nicotiana tabacum. IX. Mutations following treatment with *x-rays* and radium" and "Meiotic phenomena characteristic of first generation progenies from *x-rayed* tissues of Nicotiana tabacum." Thompson and Stevenson have presented the results of researches on wheat. Studies in other groups of higher plants include a paper on maize by Burnham, a study of *Cucurbita* by Castetter, Muncie and Patel's study of sweet peas, and a preliminary report on *Pisum sativum* by Isabel Bunten. Concerning the lower groups the following papers of interest have been published: Allen, "Inheritance in a Hepatic" and "Gametophytic inheritance in Sphaerocarpos. IV"; and Jeannette E. Graustein, "Evidences of hybridism in Selaginella."

ECOLOGY AND PLANT GEOGRAPHY

Publications in ecology and plant geography have been primarily concerned with studies of certain vegetation types or of surveys of limited regions. Papers of this type to be mentioned are: Steiger, "Structure of prairie vegetation"; Bauer, "Vegetation of the Tehachapi Mountains, California," a mountain range which connects the southern end of the Sierra Nevada with the coastal ranges and is therefore important in a study of plant migration; "Vegetation of the Mohave and Colorado Deserts of southern California," by the late S. B. Parish, an authority for many years on the desert flora; Lutz, "The vegetation of Heart's Content, a virgin forest in northwestern Pennsylvania"; Aikman, "Secondary plant succession on Muscatine Island, Iowa"; E. L. Reed, "Vegetation of the Playa Lakes in the staked plains of western Texas"; J. A. Larsen, "Forest types of the northern Rocky Mountains and their climatic controls"; and Raup, "The distribution and affinities of the vegetation of the Athabasca-Great Slave Lake region." Schaffner has published a paper of interest on the "Geographic distribution of the species of Equisetum in relation to their phylogeny"; and Nicholas has presented a more general work entitled "Methods in the floristic study of vegetation."

ECONOMIC BOTANY

By H. K. Hayes

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LEGISLATION

A Plant Patent Bill.—A bill passed by the 71st Congress provides for the patenting of certain types of plants. Plants eligible consist of a new and distinct variety of an asexually reproduced plant other than a tuber-propagated plant or a plant which reproduces itself without human aid. This law is of importance to plant breeders interested in the improvement of this class of plants. If all new plant creations could be patented it is probable that this would stimulate more rapid improvement. The difficulties of preventing fraud and of deciding what was eligible for patent precludes the early provision for patenting other types of plants.

PROGRESS IN OBTAINING DISEASE RESISTANT CROPS

Alfalfa.—Bacterial wilt of alfalfa is caused by bacteria which enter the plants through wounds either in the root or crown close to the surface of the soil. Jones (*Jour. Amer. Soc. Agron. 22:* 568-572, 1930) gives preliminary data which indicate wide varietal differences in reaction to bacterial wilt. Grimm, Kansas Common, and Peruvian proved very susceptibl while Ladak, Turkestan and Hardistan were more resistant. Salmon (*Jour. Amer. Soc. Agron. 22:* 802-

810, 1930) has given further data on resistance to bacterial wilt. A strain called Provence, secured by the Office of Forage Crop Investigations, U. S. Department of Agriculture, Washington, D. C., from Provence, France, appears highly resistant to wilt and to low temperatures. In preliminary trials it has given satisfactory yields of hay. Seed for wider tests is not yet available.

Oats.—For several years studies have been made with the hope of finding avariety of oats highly resistant to crown rust, *Puccinia coronata* corda. Such a result was obtained in 1929 in experiments carried out at the Iowa Agricultural Experiment Station (*Jour. Amer. Soc. Agron. 22:* 573-574, 1930). A variety of oats, Victoria (C. I. No. 2401) proved highly resistant or immune both in the seedling and mature plant stages to eight physiologic forms of crown rust. This variety was obtained from Argentina in 1927 with a collection of wheats. Victoria has some of the characteristics of both common and red oats and may have resulted as a natural hybrid between *Avena byzantina and A. sativa.* The variety should prove of great breeding value. While crown rust is especially severe in the southern states, it causes marked damage in some seasons in the northern oat growing regions.

ALPHA SWEET CLOVER

Sweet clover, *Melilotus alba,* is used widely as a pasture and forage plant. In a recent paper Kirk (*Extension Circular No. 45,* Univ. of Sask., 1929) states that the characteristics desired in sweet clover are biennial habit, prolific seed production, fine stemmed and leafy plant. These qualifications were found to a marked degree in certain aberrant plants first observed in 1924. Their probable origin is believed to be the result of mutation or of a natural cross between sweet clover and alfalfa or some other legume. By a continuous process of inbreeding and selection, three strains have been isolated with the desired characters. These have yielded well in preliminary trials and have been named Alpha 1, 2 and 3.

HARDY ROSES FOR SOUTH DAKOTA

Under this heading N. E. Hanson presents information regarding the state rose garden at Sioux Falls, South Dakota (*Agr. Exp. Sta. Bul. 240,* South Dakota, 1929). The purpose of this rose garden is not a display of cultivated varieties but primarily to originate hardy varieties for the Northwest and to solve the problem of the propagation of hardy rose stock. Extensive crosses are made at Sioux Falls and Brookings during the growing season. The Boyce-Thomas Institute for Plant Research at Yonkers, N. Y., has aided in studying problems of seed germination. Descriptions are given of fifteen hardy varieties which have been originated by Hansen. Tetonkaha has proved very hardy in the Dakotas. It is a seedling from a cross of a wild prairie rose found on the banks of Tetonkaha Lake with pollen from a hybrid of the Siberian, *Rosa rugosa.*

SELF FERTILIZATION IN SUGAR BEETS

Selection in self-pollinated lines has been accepted as a promising method of corn improvement. The placing of hybrid vigor on a Mendelian basis has led to renewed interest in the breeding of cross pollination plants by controlled pollination and selection. Experiments of different investigations with the pollination of sugar beets (*Beta vulgaris*) have given widely different results. Nilsson in Sweden obtained seed under parchment bag and was able to isolate vigorous selfed lines. Stewart and Tingey report the successful production of sugar beet seed under 2-lb. grocery bags while Down and Lavis (*Jour. Amer. Soc. Agron. 22:* 1-9, 1930) were unable to obtain seed on bagged seed stalks in 1927 at East Lansing, Michigan. They did obtain close fertilized seed by space isolation in well-sheltered city gardens, a method which they recommend for the inbreeding of this plant.

HYBRID VIGOR IN EGG PLANTS

First generation crosses in corn appear of great promise as a means of seed corn production. A recent report by Kakizaki (*Jour. of Heredity 21:* 253-258, 1930) states that egg plants which are normally self-pollinated can be improved by the use of first generation crosses as the commercial crop. The flowers must be pollinated by hand but in some cases 2,500 seeds have been obtained by a single pollination. Seed of two first crosses, which have yielded 50 to 75 per cent increase over a standard variety, is being furnished growers yearly by the Saitama Agricultural Experiment Station for the purpose of practical culture and in sufficient quantities to plant 100 acres yearly of the crosses.

SPECIES CROSSES

A knowledge of species relationships is of importance to the student of economic botany. Fryer (*Canadian Journal of Research 3:* 3-50, 1930) has studied cytologically the species *Medicago*, *Melilotus* and *Trigonella*. The chromosome numbers and morphology of 25 species of Medicago, 4 of Melilotus and 3 of Trigonella are given. These data are of value to plant breeders who may contemplate inter-specific hybridization of the species studied. The possibilities of combining the desirable characters of two or more closely related groups of plants which differ in chromosome numbers are of considerable interest. Wide crosses give opportunity for the selection of a greater diversity of characters. Marquillo wheat, produced at the Minnesota Experiment Station, resulted from a cross of Iumillo, a variety belonging to the agricultural group, *Triticum durum*, chromosome number n=14 with Marquis belonging to *T. vulgare*, n=21. Large numbers of progeny were studied during the segregating generations and only a few plants were of any promise. The new variety, Marquillo, is of desirable agronomic habit and in addition is resistant to black stem rust, a character obtained from its durum parent. It is now being grown commercially in the hard spring wheat region of U. S. Hope and H-44 were produced by McFadden in South Dakota from a cross of Emmer with common wheat. These new varieties are resistant to both stem and leaf rust, characters obtained from their Emmer parents, and resemble common wheat in other characteristics. These varieties are being used widely by wheat breeders in their efforts to produce new and desirable wheats for the spring wheat area. A certain amount of sterility is obtained in species crosses. Thompson (*Amer. Nat. 64:* 407-421, 1930) summarizes studies on reciprocal crosses which have been made with particular reference to the difficulty of making wide crosses. He finds that, when the two species differ in chromosome number, greater success is obtained if the species with the larger chromosome complement is used as the female parent. This is explained on the basis that as the endosperm is a result of double fertilization, shriveled seed results when the species with the larger chromosome number is used as the male and the extra chromosomes which it possesses are in a single state in the cross. In the reciprocal cross the extra chromosomes are double. Such a relation should be of considerable interest in fruit breeding where wide crosses appear of greatest promise.

SEX RATIO IN DIOECIOUS PLANTS

Studies of dioecious plants have had considerable influence in biology in aiding in the development of a logical view of the genetics of sex. The genetic cause is dependent upon inherited factors which are transmitted in the same manner as those which control other characters. Sex in plants like other characters may be modified in its expression by environmental conditions thus changing the external character without modifying the basic inheritance. Studies in asparagus, a dioecious plant, have been made by Malhotra (*Amer. Nat. 64:* 470-473, 1930). As staminate plants produce more spears and greater weight of spears than pistillate, an increase in staminate plants would lead to an increase in production. From extensive studies of commercial fields it was found that the percentage of staminate pistillate and non-blooming plants was 28.9, 60.1

and 11.1 in the Palmetto variety and 33.1, 58.5 and 8.4 in Mary Washington. Two classes of pollens have been found. The pollen was treated with various physiological methods and then used to pollinate control series. The treatment was believed to lead to a change in the ratio of staminate and pistillate plants in the progeny. Further studies may lead to the development of a method whereby the number of staminate plants may be greatly increased.

ECOLOGICAL STUDIES OF FOREST PLANTS

Ground vegetation may be used as an indicator of forest growth (*Lake States Forest Experiment Station Technical Notes No. 25*, 1930). The most characteristic plants in the ground cover of hardwood forests of maple-birch-basswood is made up of ground hemlock, beech, and maiden hair fern while a jack pine forest is characterized by a ground cover of bearberry, blueberry, sweet fern and reindeer moss. Certain plants can be used as indicators to predict the expected yearly growth. Thus in pure white pine, a ground vegetation "of twin flower, bracken fern, trailing arbutus and wintergreen indicates a mean annual growth of only about 90 board feet per acre at 50 years. When mandrake, jack in the pulpit, maiden hair fern and downy yellow violet are present, the growth may be as high as 315 board feet."

EXPERIMENTAL STUDIES OF HAIL INJURY

An experimental study of the probable effects of hail injury has been made in corn for the purpose of evaluating the extent of hail damage (*Jour. Amer. Soc. Agron. 22:* 164-170, 1930). The studies have not led to the development of a formula for the calculation of hail injury but it is hoped that eventually such a result may be obtained. The treatments consisted of removing a definite leaf area from experimental plants and comparing their yielding ability with control or untreated check plots grown in adjoining rows. Injury to the leaf blades when applied at silking time was of greatest effect on yield. On Aug. 1 when 10 per cent of the plants were in silk the removal of 20 per cent leaf area led to a reduction in yielding ability of approximately 20 per cent. Removal of 50 per cent of leaf area on Aug. 11, Aug. 18 and Aug. 28, respectively, led to a reduction in yield of 21 per cent, 19 per cent and 9 per cent, respectively. After the corn was in the early dent stages or about Sept. 15, removal of a part or all of the leaf blades led to a slight increase in the yield of grain while removal of all leaf blades on Aug. 11, Aug. 18 and Aug. 28, respectively, led to 87 per cent, 77 per cent and 57 per cent of a reduction in yield.

DROUGHT RESISTANCE

The Plant in Relation to Water, by N. A. Maximov, published by George Allen and Ulwin, London, is an authorized English translation, under the editorship of R. H. Yapp, of this important Russian work. It is, as the title states, "a study of the physiological basis of drought resistance." A considerable part of the experimental data cited was drawn from crop plants. The book is divided into two parts under the headings, "the absorption of water by the plant" and "the water balance and drought resistance of plants." In discussing drought resistance in crop plants, the writer points out that there are many causes some of which are not correlated with true physiological resistance. Thus early ripening varieties may escape the dry period. Anatomical peculiarities which characterize a xerophilous structure—small cells, numerous small stomata per unit area, a relatively large root system—are of importance. But of greatest importance is the capacity to endure without injury an intense loss of water, a property of protoplasm to endure considerable fluctuations in its degree of swelling without serious injury.

ENTOMOLOGY

By E. Porter Felt

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PLANT QUARANTINE AND CONTROL ADMINISTRATION

Economic Value of Quarantines.—The State of New Jersey has published in *Circular 182* of the Bureau of Statitstics and Inspection, Department of Agriculture, a study of the economic costs of quarantines in that commonwealth, in an effort to establish a sounder basis for the administration of quarantine regulations. It was found that 27 nursery and greenhouse concerns reported costs of over $125,000 in meeting Japanese beetle and Asiatic beetle quarantine regulations and that 43 nurseries and greenhouse concerns lost, on account of quarantine regulations, business amounting to 15.6 per cent of their gross business. The cost of administering the regulatory work, both state and Federal, was $180,000. The relation between state and Federal funds for a twelve-year period, 1918 to 1929, was approximately $350,000 for New Jersey and $779,000 for the Federal Government. It is evident from this preliminary study that the indirect costs of quarantines far exceed the cost of administration. Various agencies, particularly those adversely affected by quarantine regulations, are urging a study of the entire situation. It is even possible that there may be a congressional investigation, since there is a feeling that, basically, quarantines are economic, and their advisability must be determined by a study of both sides of the ledger. The House inquiry into the Mediterranean fruit fly situation with hearings at Orlando, Fla., and at Washington, was a step in this direction.

Mediterranean Fruit Fly.—A Federal Fruit Fly Board, consisting of Dr. W. C. O'Kane, New Hampshire, Chairman; Dr. P. J. Parrott, New York; Dr. J. J. Davis, Indiana; Dr. W. P. Flint, Illinois, and Dr. George A. Dean, Kansas, was appointed Jan. 9 by the Secretary of Agriculture and charged with the consideration of all biological and entomological questions and the determination of policies in actual fruit fly eradication work. Dr. Wilmon Newell, who had been the Federal administrative agent in carrying on the Mediterranean fruit fly inspection work in Florida, resigned early in the year and his duties were taken over by Dr. O'Kane. A number of orders or modifications were issued during the year, these being made possible by the inability of the numerous scouts to find evidence of the fly throughout the earlier infested area. The sterilization of fruit to be shipped to the South, West and Southwest was not required after Oct. 1. Sixteen counties in Florida were released from restrictions as of Oct. 15, since but three fruit fly infestations had been found during the previous thirteen months. In November, regulations were modified to permit shipment of citrus and other fruits from the regulated area by truck. Later it was announced that the Federal quarantine on Florida products on account of the Mediterranean fruit fly would be lifted, effective Nov. 15. This action removed all remaining restrictions on the interstate movements of host fruits and vegetables from the regulated area, and followed a conference with Florida officials and members of the State Plant Board. Intensive field inspection by the Federal forces will be continued indefinitely in respect both to fruit in the groves and in packing houses as a protection against the spread of any infestation. The action taken above indicates that the Department of Agriculture now considers it safe to remove restrictions on shipments from the state. Since the pest was discovered in Florida in April, 1929, the Federal Government has expended approximately $6,355,000 in control and exterminative work.

Japanese Beetle.—There have been no remote infestations by this insect discovered during the past 12 months, though there has been an extension of the infested territory in most directions. With very few exceptions, outlying infestations found in 1929 have persisted and even increased in both area and density. A progressive step has been taken this year in dividing the infested territory into generally and lightly infested areas. The restrictions on the interstate movement of farm products apply only to the generally infested area. Soil movements from the generally infested area into lightly infested sections and also from both generally and lightly infested areas to uninfested territory come under restrictions. There are now nine states, Connecticut, Delaware, Maryland, Massachusetts, New York, New Jersey, Pennsylvania, Rhode Island, Virginia and the District of Columbia with generally infested areas. Massachusetts and Rhode Island at present have nothing but lightly infested sections. Federal quarantine regulations apply to Connecticut, New Jersey and Rhode Island and also to the District of Columbia. More extensive tests have been made of the possibilities of trapping and destroying Japanese beetles, and marked improvements have been made in the traps designed for this purpose.

Asiatic Beetle.—The Federal quarantine on account of the Asiatic beetle, *Anomala orientalis*, and the Asiatic garden beetle, *Aserica castanea*, was revoked by the Secretary of Agriculture, effective March 1.

Gipsy Moth.—There has been no very marked change in the gipsy moth situation in New England and New York. The integrity of the barrier zone has been preserved. The isolated infestation in New Jersey is near extinction. The most serious development was the finding in 1929 of an extensive infestation on Long Island. There has been a concentrated effort by New York state and Federal authorities to eradicate this as speedily as possible.

Satin Moth.—There has been an extension of the area infested by this insect and an increase in abundance in some areas to such a degree as to rsult in some extensive defoliations.

European Corn Borer.—The hot, dry weather of last summer was an important factor in reducing infestation in the Ohio section in particular. The decidedly limited spread of the past season has possibly been due, in part at least, to the unfavorable character of the season. The northern half of New Hampshire has been added to the regulated area on account of the two-generation strain. Clean shelled corn has been exempt from quarantine restrictions. Recently published results of investigations of the status of this insect in Europe indicates that "there are apparently no climatic or cultural reasons why the distribution of the European corn borer should not extend to all points in the main corn-growing regions in the United States." All types of corn may be severely damaged and no variety or type was observed which was practically immune to attack by the borer. The elimination of the more susceptible varieties of corn and a proper regard for the most favorable date of plant ing appear to be two of the promising possibilities for control.

Mexican Bean Beetle.—This serious pest of the southern states appeared last year for the first time in southeastern New York, southwestern Connecticut and western Massachusetts, and infestations were also reported from the Province of Ontario. The insect not only successfully maintained itself in these new areas, but has extended its range and in certain places caused appreciable losses.

SPECIAL INVESTIGATIONS

Research and Experiments.—Earlier attempts to eradicate or control the gipsy moth, the cotton boll weevil, the Japanese beetle, the European corn borer and the Oriental fruit moth have accustomed legislators and administrators to consider these undertakings in a comprehensive way, and they have come to appreciate more fully the value of research. The result has been that the primarily economic and repressive work on these and other insects has been accompanied by well-planned investigations, these latter supplying in the main fundamental data for the determination of methods for eradication or control, as the case might be. A noteworthy feature in connection with the Oriental fruit moth is the appropriation of $80,000 for large-scale experiments with bait traps on two areas of peach orchards, located in typical regions and each consisting of 500 acres. The indirect outcome of this control work has been a fuller realization of the need of coordinated study, not only among entomologists, but with other scientists. The great research organization of the Bureau of Entomology, Department of Agriculture, has been able to organize coördinated investigations of the European corn borer, the codling moth, the Oriental fruit moth and has made an effort in this direction at least in relation to the Mediterranean fruit fly. A study of this last-named insect in Europe and adjacent countries is one phase of this work. The result is that a body of information is being built up which cannot fail but have a most practical bearing upon the control of these and other injurious insect.

Drought and Insects.—The protracted dry spells of the last few years and in sections the practical failure of crops have called attention to the economic effects of such disturbances. There is a primary loss, due to the failure of various crops. There is a less evident, though distinctly important loss, which may occur among the long-lived plants, particularly the trees, and develop either primarily as a result of extreme dryness or indirectly on account of the reduced vitality being favorable to the increase of insect pests and fungous diseases. This relation is being studied for the purpose of working out a practical program for lessening drought losses.

SOCIETIES AND MEETINGS

The American Association of Economic Entomologists held its 42nd annual meeting at Des Moines, Ia., Dec. 30, 1929, to Jan. 1, 1930. Prof. Franklin Sherman was elected President and A. F. Burgess, Secretary-Treasurer. The 5th annual meeting of the Cotton States Branch was held at Jackson, Miss., Feb. 6-7; Chairman, B. R. Coad, Louisiana; Secretary-Treasurer, Oliver I. Snapp, Georgia. The 15th annual meeting of th Pacific Slope Branch was held at Eugene, Ore., June 19-20. Roy E Campbell, California, was elected Chairman and H. H. Scullen, Oregon, Secretary-Treasurer. The Eastern Branch met at the American Museum o Natural History, New York, Nov. 20 21. C. H. Hadley, New Jersey, wa elected Chairman and H. B. Weiss o New Jersey, Secretary-Treasurer. Th Entomological Society of Americ held its 24th annual meeting at De Moines, Ia., Dec. 28-30. Dr. Edith M. Patch of Maine was elected President and Prof. J. J. Davis, Indiana Secretary-Treasurer The annual address was delivered by Dr. William M. Mann. The 7th annual Rocky Mountain Conference on Entomology was held at Pingree Park, Col., Aug 18-23. The 67th annual meeting o the Entomological Society of Ontario was held at Ottawa, Nov. 6-7.

TEXTS AND MONOGRAPHS

There have been a number of desirable additions to the permanent literature of entomology. The volume on "Insects, Their Ways and Means of Living," by Robert E. Snodgrass; "A Manual for the Study of Insects," revised edition, by J. H Comstock, A. B. Comstock and G. W Herrick, and "A General Textbook of Entomology," by A. D. Imms, constitute three noteworthy volumes of decidedly diverse character and yet of an introductory or general nature "The Field Book of Ponds and Streams," an introduction to the life of fresh water, by Anne H. Morgan though primarily ecological contains much relating to insects. "A History of Applied Entomology," by L. O Howard, is an attractive, readable account of the development of applied entomology, written by one with a very large personal acquaintance among entomologists and permeated with a distinctly human interest There is another group of works of a somewhat restricted or technical character, also worthy of mention "The Handbook of the Mosquitoes of

North America," by Robert Matheson; "The Coconut Moth of Fiji," a history of its control by means of parasites, by J. D. Tothill, T. H. C. Taylor and R. W. Paine; "The Morphology, Taxonomy and Biology of Larvae of the Scarabaeoidea," by William P. Hayes, and the "Revision of the Dipterous Family Rhagonidae," by M. D. Leonard, are noteworthy contributions in this field. Index 4 to the "Literature of American Economic Entomology," by Mabel Colcord, 1925-1929, is a strictly technical publication.

COLLECTIONS

The William Barnes collection of butterflies and moths was secured for the U. S. National Museum through a Congressional appropriation of $50,000. This collection is held to be the largest and most complete in the world of this group of North American species. The entomological collections of the country are the ultimate criteria of the validity of the multitudinous species of insects, and they also contain innumerable records of great value to both the systematic and economic entomologists. The deposition of noteworthy collections in the national museums is most praiseworthy. The Entomological Society of America, recognizing the great value and importance of the insect collections of the country, has been collecting and publishing information concerning these during the last few years and this work is being extended in a special series of papers on North American institutions featuring Lepidoptera and appearing in current issues of *Entomological News.*

COGNATE SOCIETIES

AMERICAN ANTHROPOLOGICAL SOCIETY, 45 W. 45th St., New York City.

AMERICAN ASSN. OF ECONOMIC ENTOMOLOGISTS, Melrose Highlands, Mass.

AMERICAN ASSN. OF MUSEUMS, 2 W. 46th St., New York City.

AMERICAN NATURE ASSN., Lakewood, N. J.

AMERICAN NATURE STUDY SOCIETY, Cornell University, Ithaca, N. Y.

AMERICAN ORNITHOLOGISTS' UNION 1939 Biltmore St., N. W., Washington, D. C.

AMERICAN SOCIETY OF NATURALISTS, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF ZOOLOGISTS, University of Minnesota, Minneapolis, Minn.

BOTANICAL SOCIETY OF AMERICA, Cornell University, Ithaca, N. Y.

ENTOMOLOGICAL SOCIETY OF AMERICA, 1900 Race St., Philadelphia, Pa.

NATIONAL ASSN. OF AUDUBON SOCIETIES, 1974 Broadway, New York City.

NEW YORK MICROSCOPICAL SOCIETY, American Museum of Natural History, New York City.

NEW YORK ZOOLOGICAL SOCIETY, 101 Park Ave., New York City.

PALEONTOLOGICAL SOCIETY OF AMERICA, American Museum of Natural History, New York City.

REPTILE STUDY SOCIETY OF AMERICA, INC., 108 Convent Ave., New York City.

ZOOLOGICAL SOCIETY, 101 Park Ave., New York City.

DIVISION XXIII

MEDICAL SCIENCES

PHYSIOLOGY

By Percy G. Stiles

Harvard Medical School

PHYSIOLOGICAL LITERATURE

The volume of physiological literature steadily increases. According to a recent estimate (1926) the number of papers published in a year has reached 18,000. Of these, American contributors have produced about 20 per cent. Only a small proportion can have any appeal for the lay reader. His casual inspection of a periodical will probably leave him with the impression that current studies are devoted to minute and academic problems which seem far removed from Hygiene and Medicine. Yet the history of the science has shown that practical applications often follow in the train of such researches.

CONSERVATION OF BODILY RESERVES

Many examples can be cited to illustrate the means by which the living system guards against waste. Particularly striking are those afforded by the alimentary canal. In the human subject it is estimated that the total quantity of the digestive secretions in a day must be more than a gallon, probably much more. Of all the water represented very little is lost to the body; the rest is retrieved by a process of absorption. Not only is the surplus water recovered but some of the dissolved material. The great importance of this avoidance of loss is demonstrated by the fatal result of draining away from the stomach of an animal the entire secretion of the gastric glands. Life is limited to a few days.

The chief cause of the rapid decline is shown to be the removal of chloride from the stores of the body. The gastric juice contains hydrochloric acid in such an amount that its constant withdrawal must soon tax the resources of the system to keep up the supply. The survival of the animal is greatly, but not indefinitely, prolonged by the injection of chloride solutions into the circulation. Such disastrous losses are almost entirely prevented under normal conditions: the acid performs valuable services in the stomach, passes to the intestine to be neutralized, and the resulting salt is reclaimed by the organism.

REACTIONS OF THE SPLEEN

This organ, long without assignable function, has recently been shown to serve as a place for the storage of red blood corpuscles. Under certain circumstances the spleen becomes markedly contracted and the reserve corpuscles may be forced from it. This happens especially under the influence of excitement. The English physiologist, Barcroft, has found it possible to keep dogs in good health with the spleen brought out upon the external surface of the body. He finds that the organ in life is much larger than after death. It may accommodate 10 per cent or more of the total quantity of corpuscles.

The utility of the expression of corpuscles from the spleen in the crises of life is fairly evident. They increase the power of the blood to convey oxygen to active muscles. Detailed experiments make it clear that there is a proportionality between the provocation to excitement and the degree of splenic contraction. The scent of a cat upon a piece of cloth shaken before a dog caused a shrinkage of 30 per cent in the volume of the spleen. The sight of the cat reduced the spleen to one-half its usual size. After a short pursuit of its enemy the dog showed a tightly contracted spleen having only one-fourth of the ordinary volume.

"FLETCHERISM" REVIEWED

This term may not be widely familiar in 1930 but it was much discussed about twenty-five years ago. It preserves the name of the late Horace Fletcher who was a persuasive advocate of the system referred to. The central principle was that of prolonged mastication. Faithfully practised, this was reported to improve the general health, increase endurance, and lessen the hours of sleep while reducing somewhat the quantity of food consumed. An instinctive avoidance of excessive protein intake was noted. Fletcher's books and lectures secured him a numerous following for a time but the enthusiasm awakened was soon on the wane. A most painstaking attempt to go over all the ground again has been made by Holck of Chicago.

A period of five years was required for the undertaking. For 17 months mastication was protracted to the limit of endurance. Before and after this there were long terms of spontaneous conduct in the matter of feeding with careful observations of the physical condition. The moderate reduction of the ration recorded by Fletcher was confirmed. It amounted to about 500 calories per day (from 3,500 to 3,000). A loss of weight resulted—some 17 pounds in all—which was not unwelcome to the heavy subject. It was not clear that there was any discrimination against protein. There was no gain in neuromuscular performance nor in the accuracy of typewriting. A solitary item was set down in favor of the Fletcher regimen: chess problems were solved more readily than before.

ALTITUDE ACCLIMATIZATION

Some additional data have been made available regarding this interesting matter. The chief difficulty encountered by the organism at great heights is oxygen shortage. The barometric pressure is reduced at an elevation of 19,000 feet to about half the sea-level standard. Even at lower altitudes, as that of Pike's Peak (14,000 feet), there is necessarily a failure to saturate the blood with oxygen. The disturbances known collectively as mountain-sickness may result; in any case endurance is limited. Adaptation to life under these conditions can go on to a striking extent; considerable populations live permanently in Peru and Tibet at elevations greater than that of Pike's Peak.

One feature of the acclimatization process has long been known. It is a well-marked increase in the number of the red corpuscles and of the hemoglobin of the blood. Thus at 14,000 feet there may be an increase of 30 per cent in the oxygen-carrying pigment, more than offsetting the 10 or 15 per cent shrinkage in absorption for a given mass of hemoglobin. This readjustment requires some time; it may be several weeks. Grollman has shown that a more prompt response of the organism to oxygen-want can be detected. This is an increase in the output of the heart beginning with the arrival of the subject upon the Peak and continuing for about five days when it amounts to some 40 per cent.

It will be recognized that this increase in the volume of the circulation must help to satisfy the demands of the tissues. The arterial blood entering them is below normal as regards the oxygen which it offers but since the quantity of blood is made more liberal the need may still be met. In fact it is calculated that the venous blood under these conditions may contain as much residual oxygen as at sea-level. After the fifth day on the mountain the heart's output gradually declines and eventually reaches the initial figure. It would be wasteful and unnecessary to keep it up after the hemoglobin had been characteristically increased.

EXCESS OF VITAMINE

The general reader has in the past

few years become familiar with the idea that a diet may be inadequate for the maintenance of health because of the lack of certain constituents referred to as vitamines. These are organic bodies absolutely necessary for successful nutrition but required only in minute amounts. Five or six are described with some degree of confidence; the list will probably be extended. The question has now been raised whether the animal economy can be deranged by an over-supply of vitamines as well as by their scarcity. Evidence of such injury has been secured in at least one case though no practical danger to human health is suggested.

One of the vitamines best known to experimenters is the so-called Vitamine D. This is the substance, present, for example, in cod-liver oil, for want of which rickets may be established. It is not certainly known in strict chemical purity but extremely active concentrates have been obtained. These preparations are efficacious in such minute quantities that it is possible to feed a rat or other small animal thousands of times the necessary allowance. It is only with such overwhelming doses of the active principle that disturbances arise. The normal service of Vitamine D is to promote the incorporation of lime salts in the growing skeleton. In such excess it behaves as a poison and one feature of its action is the elevation of the calcium of the blood to an abnormal level. Disorders due to lack of vitamines are technically called Avitaminoses; consistently, the injury caused by too much of one of these agents is a Hypervitaminosis. Such a condition can hardly be conceived as an accidental result of food selection.

THE ADRENALS

The compound character of these organs has been made increasingly evident by recent investigations. Not long ago interest was centered on the internal tissue (medulla) and this was natural since the cells in question yield the very active product known as epinephrin or adrenalin. The surface layer (cortex) of the adrenals had not furnished extracts possessing clear-cut properties. Stil the evidence from the field of pathology pointed more and more to th importance of the cortex for the preservation of health. The decline an fatal issue of Addison's diseas seemed to be associated with cortica degeneration. It has now been show that extracts of the cortex administered to animals from which bot adrenals have been removed ma greatly prolong their survival.

THE SYMPATHETIC NERVOUS SYSTEM

This term has long been used t cover the part of the nervous organization which, in the main, mediate between the higher centers and th viscera. Most of its paths can b traced through the numerous outlying kernels of nervous tissue know as the sympathetic ganglia. Thes ganglia are so placed in the body tha it is surgically possible, though fa from simple, to effect their removal An animal so treated is said to b "sympathectomized." In cats an rats life may be preserved for a lon time after the operation. This possibility makes it clear that many o the organs can function very well i the absence of central control. I cannot be supposed that they are a perfectly regulated for the good o the whole as in the intact organism In particular it is unlikely that th sympathectomized animal can mee sudden changes of environmental conditions with the success of the normal. It requires to be protecte against the stresses and emergencie of life.

This want of resistance consequen on the loss of the sympathetic is see when there is exposure to cold. Th animals operated on have little capacity to withstand it. Many observer believe that there is a similar lowering of endurance where muscula work is concerned. Just how the sympathetic is related to the skeleta muscles is not entirely clear. It wa formerly supposed to make no connection with them. Such an anatomical connection is now concede to exist but there is a difference o opinion as to its significance. According to one view it is the function of the sympathetic to promote recovery from the effects of previous activity. This is an attractive idea for it brings the two types of nerve-supply into sharp contrast. The direct linkage between the central nervous system and the muscles, of course, serves the purpose of throwing them into contraction. The chemical changes involved are such as release energy. The duty of the sympathetic may be to promote reactions of the opposite order.

THE VENOM OF THE BEE

A recent study of the secretion laboriously collected from the poison glands of many bees has revealed a curious fact. The fluid obtained appears to be identical with the venom of the rattle-snake. In like amounts both exert the same depressing effect upon the heart and bring about a similar solution of the red corpuscles of the blood.

PATHOLOGY

By A. J. Miller
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ALLERGY

During the current year the pathology of certain infectious diseases, which might be explained on the basis of allergy, has been reviewed. The term allergy was first used by Von Pirquet to signify an altered reaction of the body. He used it in describing his observations on serum sickness especially, but extended its meaning to all forms of atypical reaction. Later Doerr, in his attempt to classify all phenomena of hyper-susceptibility, used this term to indicate all such conditions. Later this classification was not accepted by Coca, who introduced the term anaphylaxis to describe acquired hyper-sensitiveness to proteins of antigenic nature, but did not include hyper-sensitiveness which is acquired in bacterial infections. These reactions are not specifically described by the term allergy, except in a very general sense, but the phrase bacterial hyper-sensitiveness is quite specific and perhaps should be used as a substitute for the term allergy in the literature pertaining to the changed reactions of the body as a result of previous sensitization from inoculation.

Clawson discusses this question and gives us the report of experimental streptococcic inflammation in normal, immune and hyper-sensitive animals. He points out that there is a similarity in the reactions produced in the normal, immune and hyper-sensitive animals, but that in the immune animals the size of the dose necessary to produce the lesion is much smaller and that in the case of immune animals the same dose of organisms might result in a lesion of somewhat different type, for instance, the larger lesions, as a rule, are abscesses, the smaller ones are nodular because of exudate at the focus, but do not go on to abscess formation.

Similar work has been done by Stillman and Branch in their observations of mice which were inoculated with pneumococci. They observed that 20 to 50 per cent of these animals which had developed some immunity to the organisms by previous inoculation of the respiratory tract, developed typical pneumococcic pneumonia, while the others did not develop such a condition, except in a rare instance. It was also observed by them that the previous inoculation by pneumococci was not absolutely essential for the production of the disease, but that in the sensitized animals, pneumonia occurred much more frequently. Other individuals have made similar observations in pneumonia experimentally produced in rabbits.

In the case of tuberculosis a similar observation was recorded by Medlar and Sasano. In the early lesions produced in the intestinal mucosa of guinea pigs inoculated with tubercle bacilli the reaction of the body consisted of polymorphonuclear leucocytic invasion with necrosis. The typical tubercle failed to appear, but in the subsequent lesions typical tubercles were regularly found. There are many observations recorded which indicate that in tuberculosis the lesion is more readily produced in the animals that have been previously sensitized, or in the secondary and subsequent lesions of a tuberculous animal. It has also been shown repeatedly that previous sensitization is not necessary in order to produce the typical pathology of tuberculosis in the laboratory animal. Clinical studies would also indicate typical tuberculous lesions may be produced by a primary inoculation.

The present studies of this notion perhaps can be formulated as follows: That the primary inoculation in many infectious diseases does not result in the same reaction which may follow subsequent inoculations, or subsequent lesions in the body after primary inoculation, but that in many instances the typical pathology of an infectious disease can be produced in the primary lesion if the amount of antigen is large. This is especially true in the diseases to which general immunity is of no consequence. This work will materially aid in the understanding of the pathology and pathogenesis of a large group of infectious diseases.

HYPERTENSION AND RENAL DEFICIENCY

Experimental evidence has been produced which would indicate that renal deficiency does not result in hypertension. Apfelbach and Jensen came to this conclusion as a result of experimental renal deficiency produced in dogs by infecting the kidney with an inert substance. These animals presented the typical findings of chronic renal deficiency except that in no case did hypertension or edema occur. There is no experimental evidence on record indicating that hypertension is ever the result of renal deficiency alone. It is a common clinical teaching that renal deficiency is associated with hypertension and edema. The idea that these two signs are the result of renal deficiency must be revised. It is still possible, however, that in chronic nephritis toxic substances might be liberated from the kidney during the inflammatory process, which destroys it, that will cause hypertension or edema. It cannot be claimed that infraction of the kidney is identical with the type of destruction that goes on in the kidney during chronic nephritis, except in the arterio-sclerotic type of kidney disease, and in this type of kidney disease there are many observations to the effect that it may not be associated with hypertension and edema. The idea that edema and hypertension are not caused by kidney deficiency is sound. It is possible, however, that in renal disease, other than arterio-sclerosis, toxic substances are formed in the process of kidney damage and that these may cause edema and hypertension.

PSITTACOSIS

The pathology of psittacosis has been described in detail by Maclachlan, Permar and Rogers. The reaction in the lung is pneumonic in type. The lung is solid because of inflammatory exudate filling the air sacs. In the early stages the reaction consists of polymorphonuclear leucocytes and fibrin. These substances are rapidly replaced by mononuclear phagocytes. There is some necrosis of the air sac walls and also the walls of the bronchioles. In the walls of the bronchioles and air sacs there is no cellular exudate, but blood vessels and lymphatics are engorged. There is a rather marked hyperplasia of the cells lining the alveoli. In the earliest stages the bronchioles are filled with inflammatory exudate and apparently this results in the collapse of large portions of the organ. The other viscera show only the common reaction to infectious diseases, engorgement of the vessels and cloudy swelling.

MEDICINE

By Russell L. Cecil

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INTRODUCTORY

Although there have been no epoch-making discoveries during 1930, a large number of basic facts have been accumulated and much knowledge has been acquired. Medicine has been drawn much closer to the fundamental sciences, particularly by the chemical and biologic studies that have been made on various bacteria, and by the isolation of the active principle of liver as used in the treatment of pernicious anemia. Three infections, including the common cold, have entered the ranks of diseases due to filtrable viruses. The diagnosis of urological conditions should attain a higher degree of accuracy because of the discovery of uroselectan, the intravenous injection of which makes it possible to visualize the urinary tract.

TUBERCULOSIS

A monograph by Sabin, Doan, and Forkner appeared in the latter part of the year in which they summed up the recent chemical studies on the tubercle bacillus, and the response of tissues of the individual fractions. The organism has been separated into four lipoid, a protein and a polysaccharide fraction. Certain of the lipoids were found to produce tubercular lesions in the tissues, including the formation of epithelioid cells and epithelioid giant cells in masses similar to tubercles, and the development of characteristic tubercular granulation tissue. The protein and polysaccharide of the organism do not stimulate the formation of tubercular tissue. The protein is toxic to normal rabbits causing fever and a local response of leukocytes and phagocytes, but with no proliferation of connective tissue. The polysaccharide is toxic when introduced intraperitoneally, and causes a leukocytosis, but no connective tissue changes. Further studies by Petroff and Kahn demonstrate the dissociation of different strains of the tubercle bacillus. Impetus was given to these studies by a disaster in Lübeck, Germany, in which a number of deaths occurred following the immunization of children with the B.C.G. strain of tubercle bacillus. Investigation suggests that the dissociation of the B.C.G. into a virulent strain had occurred.

THE COMMON COLD

The common cold is the most prevalent and perhaps the most important of human diseases. The economic loss of time resulting from this ailment assumes vast proportions, and perhaps what is of more importance is the fact that such fatal diseases as pneumonia and tuberculosis are usually initiated by this condition. Numerous investigators have attempted to show a relationship between the cold and the organisms commonly found in the pharynx and nasopharynx, and, at some time or other, each of these organisms has been given the credit of being the causative agent, but without sufficient confirmation.

During the past year evidence has accumulated which indicates that colds are caused by a filtrable virus. Dochez, Shibley, and Mills transmitted characteristic common colds to the higher apes by filtrates from naso-pharyngeal washings obtained from individuals within 24 hours of the onset of the cold. Filtrates from normal individuals were not effective. Long and Doull transmitted colds in the same way to human volunteers. The latter investigators found that small gram-negative anaerobic bacteria could be cultivated from the ordinary Berkefeld filtrates. However, they were able to transmit the colds by means of bacteria-free filtrates. These experiments substantiate the conclusion that a filtrable virus is the exciting agent of the common cold.

PSITTACOSIS

More than 500 cases of psittacosis (parrots' disease) were reported during 1930. This epidemic initiated investigation of the etiology of this disease. Bedson, Western, and Simpson, in England, and Krumwiede, McGrath, and Oldenbusch, in America, have independently recovered a filtrable virus from patients with the disease and from infected parrots, and have been able to transmit the disease to parrots and mice. Rivers, and his co-workers produced infections with the filtered material in parrots, mice, rabbits, and monkeys, and found that parrots and rabbits that had recovered from the primary infection were refractory to re-infection.

PERNICIOUS ANEMIA

In 1926, Minot and Murphy showed that the feeding of liver to patients suffering from pernicious anemia increases the number of reticulocytes and mature erythrocytes in the blood. Since that time a great effort has been made to demonstrate the specific action of liver, and to isolate its active principle. In 1929, Sturgis and Isaacs demonstrated that desiccated stomach was also effective. This work has been corroborated by a number of investigators, and it has also been shown that kidney and certain other tissues have the same effect. In August, 1930, West and Howe reported that they had isolated an active crystalline salt which was clinically potent in pernicious anemia. Within a few weeks, the same investigators, collaborating with Dakin, announced that the active crystalline salt was a combination of beta-hydroxyglutamic acid and hydroxyproline. Both of these substances are protein derivatives.

UROSELECTAN

In 1923, Rowntree, and his co-workers showed that the urinary bladder, and, in some cases, the pelvis and ureter could be visualized radiographically after the intravenous injection of a 10 per cent solution of sodium iodide. The following year, Rosenstein and von Lichtenberg reported their results using sodium iodide. Further work was done using various halogen compounds; these were administered intravenously and also by ureteral catheter, and it was found that satisfactory visualization of the kidney, pelvis and ureter could be obtained. In recent articles Swick and Jaches have reported the use of the sodium salt of 5-Iodo-2-Pyridon-N-Acetic Acid. When given intravenously visualization of the entire urinary tract is obtained. The advantages of this method are: 1. Instrumentation is avoided which is usually very unpleasant to the patient and which sometimes causes temporary inhibition of the function of the kidney; 2. The entire urinary tract, including the bladder, is shown at one application; 3. Certain anomalies such as double ureters are revealed, which would not be discovered by ureteral injection; 4. Satisfactory visualization is obtained even with stricture of the ureter; 5. The dye is very easily administered, and is not frequently followed by reactions. This method of visualizing the urinary tract by X-ray should aid considerably in the diagnosis of urological conditions. The work reported up to the present time suggests that the excretion of the dye may also give an excellent index of urinary function.

BIBLIOGRAPHY

SABIN, F. R., DOAN, C. A. and FORKNER, C. E. "Studies on Tuberculosis," *Supplement No. 3, J. Exper. Med.*, (Dec. 1) 1930, 52:6.

DOCHEZ, A. R., SHIBLEY, G. S., and MILLS, K. C. "A Study of Acute Infection of the Respiratory Tract in the Ape," *Proc. Soc. Exper. Biol. & Med.*, (April) 1929, 26:562.

SHIBLEY, G. S., MILLS, K. C., and DOCHEZ, A. R. "Etiology of the Common Cold," *J. A. M. A.*, (Nov. 22) 1930, 95:1553.

LONG, P. H., and DOULL, J. A. "Etiology of Acute Upper Respiratory Infection," *Proc. Soc. Exper. Biol. & Med.*, (Oct.) 1930, 28:53.

BEDSON, S. P., WESTERN, G. T., and SIMPSON, S. L. "Lancet," (Feb. 15) 1930, 1:345.

Krumwiede, C., McGrath, M., and Oldenbusch, C. "Science," 1930, 71:262.

Rivers, T. M., Berry, G. P., and Rhoads, C. P. "Psittacosis," *J. A. M. A.*, (Aug. 23) 1930, 95:579.

Minot, G. R., and Murphy, W. P. "Treatment of Pernicious Anemia by a Special Diet," *J. A. M. A.*, (Aug. 14) 1926, 87:470.

Sturgis, C. C., and Isaacs, Raphael. "Desiccated Stomach in the Treatment of Pernicious Anemia," *J. A. M. A.*, (Sept.) 1929, 93:747.

West, R., and Howe, M. "A Crystalline Derivative of an Acid Present in Liver, Active in Pernicious Anemia, *Jour. Biol. Chem.*, (Aug.) 1930, 88:427.

Dakin, H. D., West, R., and Howe, M. "Further Note on a Substance in Liver Active in Pernicious Anemia," *Proc. Soc. Exper. Biol. & Med.*, (Oct.) 1930, 28:2.

Osborne, E. D., Sutherland, C. G., Scholl, A. J., Jr., and Rowntree, L. G. "Roentgenography of Urinary Tract During Excretion of Sodium Iodide," *J. A. M. A.*, (Feb. 10) 1923, 80:368.

Rosenstein, P. and von Lichtenbprg, A. "*Verhandl. d. deutsch. Gesellsch. f. Urol.*," 1924, 6:320.

Swick, M. "Intravenous Urography by means of the Sodium Salt of 5-Iodo-2-Pyridon-N-Acetic Acid," *J. A. M. A.*, (Nov. 8) 1930, 95:403.

Jaches, L. "Intravenous Urography (Swick Method), *J. A. M. A.*, (Nov. 8) 1930, 95:1409.

PHARMACOLOGY

By Harry Gold

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DIGITALIS

Several years ago experiments were carried out at the Rockefeller Institute in New York which showed that the heart may be prevented from dilating in the course of pneumonia by the administration of digitalis. Up to that time the drug had been used sporadically to support the circulation in this disease. This work created such wide interest that in many institutions and in the hands of many practitioners its use became a routine measure. More recently an investigation of the value of digitalis in pneumonia was carried out by a committee at Bellevue Hospital. More than 800 patients with pneumonia were studied with carefully controlled procedures. The results were startling. They showed that the mortality rate for patients treated with digitalis was not smaller than for similar patients who did not receive the drug. As a matter of fact, the patients who were digitalized showed an even greater mortality rate in some groups. The conclusion reached by these workers was that the routine administration of digitalis in patients with pneumonia is not only without benefit but may be dangerous; that the use of digitalis in pneumonia should be governed by the same rules that determine its use in cardiac disease in general.

CORTICAL HORMONE

The study of potent extracts of the cortex of the adrenal glands has been carried forward with considerable success by the work of Swingle and Pfiffner. They described their experiments (*Science*, May, 1930) in bilaterally adrenalectomized cats which they kept alive for a hundred days by the subcutaneous injection of 1 to 2 cc. of the extract. The animals died in 10 days when the injections were discontinued. In some cases the substance was withheld until signs of adrenal insufficiency appeared—muscular weakness, loss of appetite and loss of weight. With the resumption of treatment these symptoms disappeared. While receiving suitable doses of this extract the animals appeared entirely normal. Such potent extracts have very important therapeutic possibilities.

PITUITARY PRINCIPLE

In the article on pharmacology of last year reference was made to the work of Kamm and his associates of the Parke Davis Laboratories, the results of which were taken to show that the infundibular portion of the pituitary gland contains three or more separate hormones. Their work created considerable enthusiasm because they had isolated an oxytocic subtsance relatively free of the other pituitary actions (oxytocin) and another substance (pitressin) which they believed were essentially the pure pressor principle of the pituitary, though they recognized that it also possessed the melanophore and antidiuretic actions. The chemical investigation of pituitary principles is, however, beset with numerous pitfalls. This work had barely taken hold of the popular imagination when Prof. John J. Abel of Johns Hopkins brought forth most convincing evidence that their interpretation of results was incorrect. In a recent paper (*J. Pharm. and Exp. Therap.*, October, 1930) he has shown that all the subsequent work supports his views published in 1923, that "all the evidence at hand is greatly in favor of the belief that the oxytocic, pressor, diuretic and respiratory activities of posterior pituitary extracts are properties of one and the same substance." At that time he had prepared a pituitary tartrate that had approximately 166 times the oxytocic value of the present standard pituitary powder, hence even stronger than the oxytocin of Kamm and his collaborators. In the purification of his pituitary tartrates some cleavage of his unitary substance took place, but the tartrates of lower assay values were unitary in character. Abel has now prepared a unitary pituitary product in the form of a powder which contains all the physiological actions of the standard pituitary powder but is 50 to 60 times as potent as the latter for all the three actions. He estimates it to contain about 50 per cent of impurities and still it possesses three times the pressor potency of commercial pitressin which Abel found to be only about 16 instead of 80 times as potent as standard pituitary powder, as maintained by the manufacturer. He also showed that any drastic chemical manipulation disturbs the relative titres of the different actions of the pituitary extract resulting from the splitting up of the unitary product; that pitressin and oxytocin are grossly impure cleavage products of this unitary principle rather than preformed constituents of the gland; that pitressin represents the fraction of the unitary molecule remaining after the more easily split fraction, oxytocin, is removed. He calls attention to the fact that while Kamm and his associates have apparently succeeded in separating the cleavage product, oxytocin, their pitressin was not a pure pressor principle but a "heterogeneous mixture of inert and active products."

DRUG COMPARISONS

A recent study by Macht and Leach of twenty-three stereoisomeric octyl alcohols called attention to certain points of fundamental importance from a scientific standpoint. They showed not only that such isomers exhibit quantitative differences in their action which has been shown by others with other drugs previously, but that if a compound is found more potent than its isomer in terms of one action, it may not be so in terms of another, or in terms of the same action in a different test animal. These findings contain a warning against sweeping generalizations as to the relation between chemical structure and physiological actions that are sometimes made on the basis of limited experimental data.

IRRADIATED ERGOSTEROL

Viosterol (irradiated ergosterol) has become one of the most common sources of Vitamin D in clinical practice for the prevention and treatment of rickets and other deficiency diseases. In the past few years attention has been directed to the possible toxic effects of overdoses of this substance because in large doses it has been shown to produce an increase in the blood phosphorus and blood calcium, increased excretion of calcium, and excessive deposits of calcium in the tissues. These effects are usually referred to as signs of "hypervitaminosis" and various mechanisms for their production have been considered, such as, increased absorption of calcium and phosphorus, diminished excretion of these elements resulting in a positive balance in the body, or mobilization of calcium and phosphorus stores in the bones. More recent work, however, shows that the toxic effects of viosterol are not at all or only partly due to the antirachitic factor. Holtz and Schreiber set forth evidence showing that the Vitamin D and the toxic factor can be separated. J. C. Hoyle of Cambridge has published the results of several investigations on the same subject. He found that ergosterol that has been irradiated in oil produces toxic effects due only to the excess of Vitamin D (impaired growth and calcium phospate calculi in the urinary tract, calcium deposition in tissues being rare or slight). However, when ergosterol has been irradiated in alcoholic solutions the toxic effects are due to another factor arising as the result of the overradiation and independent of Vitamin D. In such cases there occurs acute enteritis, marasmus, atrophy of lymphoid tissue, extensive calcium deposition in tissue and death. He also found that a natural milk and bread diet protects these rats against the effects of this unknown toxic factor.

INTRACARDIAC INJECTIONS

Dr. Carl J. Wiggers reported the results of perfusion experiments with the isolated cat's heart showing that the intracardiac injection of drugs, such as epinephrin, strophanthin, quinidine and others into the right ventricular cavity produced effects upon the left ventricle. From the conditions of the experiments he was able to conclude that the Thebesian circulation carried the drugs to the left ventricle. He concludes further, however, that the intracardiac injection of drugs is a justifiable procedure and may offer considerable promise in circulatory failure. This is contrary to the current opinion expressed in an editorial in the *Journal of the American Medical Association* on the value of intracardiac injections for resuscitation. Wiggers' experiments are exceedingly interesting in so far as they show the passage of drug from one to the other ventricle by way of the Thebesian vessels. It is questionable how far they apply to the resuscitation of a heart that is stopped because in his experiments the right ventricle was beating, thereby creating a pressure and maintaining sufficient circulation to enable the drug to be absorbed.

DEFECATION CENTER

A few years ago Hatcher and Weiss postulated the presence of a reflex defecation center in the medulla and obtained some evidence for its existence in their studies on vomiting. Koppanyi and Lieberson investigated this question further in the Department of Pharmacology of Cornell University Medical College and have presented fairly conclusive evidence for the existence of this center from the fact that centrally acting drugs that cause defecation become ineffective after the center has been destroyed and after paralysis of the afferent nerve endings by other drugs. They also made interesting observations on the vomiting mechanism. It was previously held that if an animal failed to vomit from a central emetic like apomorphine after mechanical destruction of the vomiting center, the animal would fail to vomit from any emetic local or central. The above authors reported experiments, however, in which dogs surviving for months after operative destruction of the center failed to vomit from apomorphine, but retained their capacity to vomit from certain locally acting emetics like zinc sulphate by stomach. It is not known whether this merely represents an incomplete destruction of the center so that the weaker apomorphine action is lost and the stronger zinc sulphate action retained, or that the locally acting emetic makes use of a somewhat different vomiting mechanism.

ARSENOTHERAPY

For many years the division of pharmacology of the Hygienic laboratory has been engaged in the study of the mechanism of action of the arsenicals as they are used for the treatment of syphilis and trypanosomiasas. They have shown that the organic trivalent arsenicals are effective by virtue of the liberation of arsenoxide. In a recent study with the crystalline sulphydril glutathione they were able to confirm earlier work showing that the action of trivalent arsenious oxides involves a chemical reaction with sulphydril compounds of the protoplasm of living cells. They found that sulphydril glutathione protected trypanosomes against arsenious oxide in vitro. They also found that rats survived a fatal dose of sodium arsenite or arsenoxide if they were previously protected with a suitable dose of SH-glutathione; and also that the local inflammatory reaction of arsenious oxide could be prevented by the addition of the latter to the arsenic solutions.

An interesting contribution to the subject of arsenotherapy from a somewhat different angle was made by G. A. Cooper of the University of Wisconsin. He showed that doses o various arsenic compounds are mor effective when given to rats som hours after the trypanosome infectio has been under way than when give simultaneously with the inoculation He interprets this as showing tha the disease produces a change in th body which is necessary for the curative action of the arsenical.

CINCHOPHEN POISONING

Cinchophen derivatives were introduced for the treatment of gout mor than twenty years ago. Though the did not fulfill the expectations i gout, they were found to relieve rheumatic pains and became almost common household remedies for that purpose. It was about 15 years befor the fact became known that they ma produce serious injury to the liver Reports of cinchophen poisoning hav become frequent in the literature onl in the past two or three years. It i important to bear in mind that th drug is still sold to the public unde a variety of names that preclude it identification.

SURGERY

By Frank L. Meleney, M.D.

Assistant Professor, Columbia University

INTRODUCTORY

One year is too brief a period in the course of surgical progress to make it possible to estimate the significance of any event. It is rare, if ever, for one year to see the beginning and completion of any important surgical discovery. Many men make their contributions to any forward movement, and its significance can be determined only after it has had fairly wide application. It usually takes five to ten years after the original work has begun before its worth can be measured. In this brief review we can only offer our opinion as to events which began several years ago and which seem to have come to a high level of significance in the yea under consideration. In subsequen years these events may rise to greate prominence or be plunged int oblivion.

INJECTION TREATMENT OF VARICOSE VEINS

During the past year there has bee a more general acceptance of a method of treatment which has been mentioned in two previous reviews namely, the injection treatment o varicose veins. The success of thi procedure has taken this disease ou of the field of operative surgery Payne reviews the situation in a ver clear and concise manner. He point ut that the operative treatment of aricose veins is a tedious procedure, t is mutilating in its extensive scars and the results are frequently bad. Patients are required to spend a considerable length of time in the hospital after operation, and the danger of thrombosis and embolism is a very real one. When the skin is ulcerated or diseased, operation is dangerous because of the inevitable infection. A number of substances may be injected which effect obliteration of the veins. They so damage the endothelium that a firmly attached thrombus forms, occluding the vein and subsequently resulting, by means of contraction, to a thin fibrous cord. In a large majority of cases the pain and discomfort associated with these veins is promptly relieved, ulcerations quickly heal and skin disorders clear up. Treatment may be ambulatory. The treatment itself, or any complications which arise rarely necessitate the patient's admission to a hospital. The fear of embolism, which was in the minds of those who used this method of treatment in the early days, has not materialized. The only serious complications come from a use of these solutions in the presence of certain contra-indications. There is a consensus of opinion that these are acute phlebitis or thrombosis of the deep vessels with a chronic edema of the legs. McPheeters and Rice record ten fatalities in 53,000 cases, of which seven could be attributed to the injection. This, they claim, is considerably lower than the mortality following an operation. Minor complications arise if the injecting fluid leaks out into the subcutaneous tissues and certain patients have an idiosyncrasy to one or another of the injected fluids. Different authors prefer different solutions. The fluids which have been used are 20 per cent sodium chloride, 20 to 40 per cent sodium salicylate, 30 to 50 per cent dextrose, 75 per cent invertose, and 10 to 15 per cent quinine hydrochloride with 5 to 7 per cent urethane. It is perhaps safe to state that in the future the indications for different solutions may be more clearly defined.

AVERTIN NARCOSIS AND ANESTHESIA

Within the last few years there has been an increasing use of Avertin (tribromethyl alcohol) as a narcotic, preliminary to anaesthesia. The depth of the narcosis is such that in many instances anaesthesia is not needed and simple operations may frequently be done with the patients under the influence of this drug alone. Once a patient is narcotized with Avertin, only a very small quantity of inhalation anaesthetic is required to complete the anaesthesia for major operations. Furthermore the events of the next twenty-four or thirty-six hours will not be remembered with any clearness and this tides a patient over the usual discomfort following ether and gas anaesthesia. It is excreted by the kidneys and liver so that diseases of these organs offer contra-indications to its use. It is given by rectum, at which site it is quickly absorbed but it should not be given when there is any ulceration of the bowel. Within a few minutes of this instillation into the rectum, the patient falls off into what appears to be a natural sleep. The blood pressure usually falls between ten and thirty mm. of mercury. There is a decrease in respiratory movement. The breathing is shallow but the rate is normal or slightly quickened. Occasionally there is slight cyanosis. The usual duration of the deep narcosis is from 1½ to 2 hours and consciousness returns in about four hours.

Avertin was first made by Willstatter and Duesberg, in 1926, and put into practice by Eichholz. Its results have been so satisfactory that its use has spread very rapidly throughout Europe and this country. It is given by rectum in doses of 80-100 mg. per kilo. of body weight. The crystals are dissolved in distilled water in a 2½ to 3 per cent solution which has to be prepared immediately before use. Or a concentrated stock solution may be kept stable by the presence of amylene hydrate. It is necessary to test the final solution before administration for the presence of irritating decomposition products. It has been found that 50 per cent of the drug is absorbed in ten minutes and 75 per cent in twenty minutes. If there is the slightest sign of cyanosis in the first twenty minutes the Avertin enema should be immediately rinsed out. The significance of this new adjuvant to anaesthesia will be more apparent as its general use increases.

ACUTE APPENDICITIS

Mortality.—A growing concern has been manifested by surgeons with regard to the increased statistical mortality from acute appendicitis, which appears in the vital statistics both of this country and of England. There is some divergence of opinion with regard to the cause of this. One factor is almost certainly, better diagnosis in a condition which so often went unrecognized years ago. All of the writers on this subject feel that delay in operation is the chief cause of mortality in appendicitis. This delay is due to a failure on the part of a patient to call a doctor for what appears to him to be an attack of indigestion, and a failure on the part of the doctor to recommend immediate operation as soon as the diagnosis has been made. An acute surgical condition should be suspected in any patient with acute abdominal pain which does not respond to the ordinary method of treatment within the first six hours after the onset of the symptoms. All are agreed that administration of a cathartic is to be condemned and that enemas should only be given with extreme caution. Many surgical conditions are more easily diagnosed in the early stages than in the the late stages, for example, acute appendicitis, internal hemorrhage, acute pancreatitis, or strangulated hernia. In the late stages they may all give the same symptoms of general peritonitis. When abdominal pain is present, its site, its character, its radiation, its progress, and its response to the treatment all aid in the early diagnosis. Wilkie points out that there are two important types of appendicitis which may be differentiated by the onset and the course of symptoms. The first is the simple inflammation of the wall of the appendix. The second is obstruction of its lumen. The first is rarely fatal, while the latter accounts for about ninety per cent of the mortality. The symptoms of the first develop rather slowly, beginning with pain, often dull and aching, with nausea and possibly vomiting, with fever and rapid pulse and tenderness in the right iliac fossa. In these cases although operation is not so urgent it is advisable because there may be a concretion in the appendix which may later result in perforation and if recovery takes place other attacks are almost sure to follow. In acute obstruction of the appendix there is a sudden onset, often occurring at night with cramping pain in the abdomen, usually in the umbilical or lower epigastric region. The appendix becomes distended and gangrene of the wall occurs with perforation and spilling of the confined contents into the peritoneal cavity. In this case there may be no rise in temperature, but immediate operation is imperative.

Treatment. — Many authors feel that Ochsner's conservative method of treatment has resulted in too great conservatism in early cases, thus losing valuable time and resulting in death when early operation would have saved life. On the other hand a few authors are convinced that in late cases, namely, those coming to the attention of a doctor forty-eight hours or later after the onset of symptoms, that the Ochsner treatment is sometimes a life-saving measure. This requires the most expert surgical judgment. It must be remembered that the duration of the illness is not so important a factor as the clinical condition of the patient. When an extensive peritonitis has become established, the surgeon must decide whether to operate immediately or to be conservative. By conservative measures in a certain number of cases, the patient may be considerably improved and a later operation rendered safe. Early operation when possible and the proper selection of late cases for conservative treatment will reduce the mortality from appendicitis, to a marked degree.

DENTISTRY

By Harold J. Leonard

Professor, Columbia University

RELATION OF DENTISTRY TO MEDICINE

Dental disease is increasingly recognized as a manifestation of systemic disturbance due to defective nutrition or other faults in metabolism. Although the exact constitutional factors are not sufficiently defined to make possible a positive preventive program, every new discovery verifies the idea that dental disease prevention lies along the lines of systemic diagnosis and treatment. In other words, the man who is to treat dental disease in the future must be trained and legally qualified to do so as a physician. On the other hand, the constitutional effects of dental disease have been well established. Infections and inflammatory conditions about the teeth are not solely matters of local import. A large number of systemic diseases are now known to be caused by the entrance of bacteria into the blood stream from some point of local inflammation; and of the possible points of local inflammation those about the teeth are the most common and most frequently to blame. Irritations of nerves about the teeth due to diseased tooth pulps or impacted teeth are frequent causes of obscure neuralgias and nervous disturbances in various parts of the body reflected from the source of irritation which in itself may give no sign of trouble. The treatment must be carried out in coöperation with the dentist, who is thus obliged to understand the wider relationships of the teeth.

Progress in Relationship.—The divorce of dentistry and medicine is thus seen to be a mistake not only theoretically but practically. The fact that dentistry has been cast out of the partnership in scientific medicine and hygiene has greatly delayed the scientific attack on the problems of preventive dentistry. In respect to chemical, bacteriological and pathological research in these problems, dentistry is just beginning an adequate attack, whereas similar problems in other phases of preventive medicine have been under intensive study for over thirty years. In daily practice also the lack of information of the medical practitioner on dental matters and of the dentist on systemic relationships is a cause of endless friction and of countless errors of which the patients are the victims. A ferment is now working within both professions and in the universities toward combining Dentistry with Medicine and making it a recognized specialty. This tendency has grown within the last year to such proportions that it exists as the most significant development of the year in the profession.

Difficulties.—While it may seem a simple thing to a casual observer to unite Dentistry with Medicine in view of the very obvious reasons for such a union, there are many difficulties to be overcome. Dentistry has been developed as a technical art to a high degree. The art of dental repair is an extremely difficult one but it is primarily technical and not scientific. Medical faculties still look askance at including such a body of technical manual training in the medical curriculum for any specialty in medicine. The dentists also are jealous of the art which they have so highly perfected and view with grave apprehension any surrender of the training of its devotees to faculties that regard it so lightly. Even though adequate prevention of the common dental diseases should become an actuality in the very near future, dental repairs will still be needed for many decades to come and will still occupy the greater part of the dentist's time. For union to occur, therefore, it is necessary to reconcile these differing states of mind. The dentist of the future must be medically educated to the point of appreciating systemic relationships, and be able and legally qualified to treat dental disease by whatever systemic means is necessary, while retaining his ability to repair the ravages of disease or accident with the highest skill.

Health Insurance Factor.—While this debate proceeds in educational and professional circles, a cloud appears from Europe which may put this matter temporarily into the background. In most European countries, medical practice has been profoundly modified by the growth of health insurance. As an outcome of socialist propaganda health insurance has developed with state aid to include, in several of the larger European countries, 80 per cent of the people. These people pay premiums to non-profit making insurance companies and they are entitled to whatever medical care they need. The physicians are placed on panel, that is, in each community the names of participating doctors are posted and the patient may choose the one to whom he will apply. Fees are fixed and are paid by the insurance company. Dentistry, to a certain extent, is included in the plan of insurance.

The system has usually been opposed at first by the physicians but after trial it is fairly well liked. As it has developed its faults have been gradually overcome so that apparently it is not working to the disadvantage of the physicians. Its popularity to the mass of people is demonstrated by its very rapid spread in the last ten years. The Committee on Dental Practice of the American Dental Association is making an intensive study of the systems of health insurance as they have evolved abroad. It is attempting to formulate a plan of action for the medical and dental societies to follow which will adequately meet this evolution when it comes, so that professional standards may not be lowered.

INCOME AND INVESTMENT OF DENTISTS

Questionnaires.—At the request of the Committee on the Cost of Medical Care in Washington, the American Dental Association through its Committee on Dental Practice has made an extensive study of the income and capital investment of dentists. While the returns from the questionnaires are not tabulated the collection of the questionnaires constitutes a notable achievement. The dentists in twenty representatitve states have been questioned and nearly 70 per cent have returned replies. This is the largest proportion of returns made in any of the questionnaire studies in which the Cost of Medical Care Committee has taken part.

Economic Studies.—A great deal of attention is being given to problems of dental economics in society meetings. Much of this, of course, is superficial, with the idea of increasing dental incomes; but much of it has a serious social purpose. Among the studies being made is one on the effect on dentistry and dental practice of the advertising of dentifrice manufacturers. Misleading advertising claims for the dentifrices are coupled with pleas to go to the dentist, in order to gain the good-will of the profession. National radio advertising is a recent phase and has brought this matter acutely before the profession. No solution has yet been found.

Dentifrice Advertising.—In connection with dentifrice advertising a new development relates to the Council on Therapeutics of the American Dental Association. This very honest and courageous research committee is stating in no uncertain terms in the Association Journal the facts regarding highly advertised dental products. Already several of the most sold products have either modified their formulas to agree with their claims, or have modified their claims as a result of the disclosures of this Council. It is an organization that has been badly needed; for the profession and the public too have for years been shamefully exploited by drug manufacturers with advertising which there was no way to combat.

RESEARCH IN DENTISTRY

Dental Decay.—Progress in research in dentistry is increasingly rapid as universities take up the problems. Columbia University is now working on the causes of susceptibility to dental decay under a grant of the Commonwealth Fund of $31,000 a year for a three-year period starting in February, 1930, with the usual restrictions. The University of Michigan is working along the same line under a grant from the Couzens Foundation which started a year or more ago.

Pyorrhea.—Work is going forward at the University of California on the causes and pathology of periodontoclasia (pyorrhea) under a grant of the Hooper Foundation, started several years ago.

Infection and Disease.—At Yale University Medical School and Rochester University Medical School studies are being made of the relationship between dental infection and systemic disease under large grants from the Rockefeller Foundation. A study of the relation of nutritional defects to dental decay and periodontoclasia is also going forward at the University of Chicago Medical School in coöperation with a study group of the Chicago Dental Society. A study of the properties of metals and their alloys used in dentistry is being carried on at the Bureau of Standards in Washington.

DENTAL SUPPORT

Gifts.—Among the notable gifts of the year to Dentistry are the Dental Institutes in Paris and Stockholm, gifts of George Eastman of Rochester for the care of the teeth of the children of these cities. These are in addition to Dental Institutes given to London and to Rome last year, and to Rochester, N. Y., several years ago. A $300,000 dental institute has also been built this year in Providence, R. I., in connection with the Rhode Island General Hospital, the money coming from Col. Jos. E. Samuels of Providence. Included in the gift of the General Education Board to Tulane University for a new medical school is a provision for 45,000 square feet of space for Stomatology. This university, like Cincinnati and Vanderbilt, is one that has discontinued its dental school as such.

The trend of support for dental education seems to be definitely in the direction of making it a department of medicine. The fact that large funds can be obtained for research, endowment and building for dental education as a department of medical education closely integrated with fundamental science, while, with few exceptions, appeals for funds by dental schools not so integrated have been refused, may be the deciding factor in bringing dentistry into the medical fold. The time is almost past when dental education and dental practice can be conducted independently, and unrelated to the larger fields of fundamental science and medical practice.

PUBLIC HEALTH AND HYGIENE

By Ira V. Hiscock

Associate Professor, Yale School of Medicine

THE NATIONAL INSTITUTE OF HEALTH

By act of Congress approved May 26, 1930, entitled "An act to establish and operate a National Institute of Health, to create a system of fellowships in said institute, and to authorize the Government to accept donations for use in ascertaining the cause, prevention, and cure of disease affecting human beings, and for other purposes," the Hygienic Laboratory of the United States Public Health Service will hereafter be known as the National Institute of Health. The general purposes of the act are to provide larger facilities for investigations of a public health nature, to encourage research and the training of individuals, to enable the Government to accept bequests to aid this work, and to bring about coöperation development is far-reaching in its significance. The Hygienic laboratory has a fine tradition. Scientific research in relation to public health has been considered a most important function of the Federal Government. But problems of prevention and control of disease are becoming increasingly complex. A sum of $750,000, or so much thereof as may be necessary for construction and equipment is authorized. In order that those who make gifts may have a living part in the development, provision is made whereby donations of $500,000 or over will be acknowledged permanently by the establishment within the institute of suitable memorials. (*Public Health Reports*, U.S.P.H.S., June 20, 1930.)

THE WHITE HOUSE CONFERENCE

President Hoover, in July, 1929, called together a group of national leaders in the field of child care and protection to inaugurate a most important movement to the nation as a whole. "That is, that we should take national stock of the progress and present situation in the health and protection of childhood; that out of this investigation we should also develop common sense plans for the with scientific institutions in the prosecution of research work. This further advancement in these directions." During 1930, throughout the United States, workers in every field that relates to the well-being of children have made generous contributions of their time and knowledge to the White House Conference on Child Health and Protection, held in Washington Nov. 19-22, 1930. The names of the conferences and committee members have been published in a directory of 246 pages. The reports of the Conference justify President Hoover's statement at the first meeting of the Planning Committee to the effect that "We already have enough knowledge which, if brought together, compared and sorted, would give us some approach to the normal child. The crux of the problem is as quickly as possible to bring what knowledge we have into the open, broadcast it, and make it familiar to the average busy, but deeply concerned parent."

U. S. CHAMBER OF COMMERCE AND PUBLIC HEALTH

In 1929, the United States Chamber of Commerce, in coöperation with the American Public Health Association, launched an Inter-Chamber Health Conservation Contest similar in form to contests carried on successfully by the Chamber in fire prevention. More than 130 cities, representative of 38 states, the District of Columbia and the Territory of Hawaii participated. Coöperation between local public health agencies and local business men was the keynote of the contest. Progress made in health conservation during the first year was recognized by a ceremony in Washington when awards were made to winning cities in each population class by the President of the U. S. Chamber of Commerce. These awards were received by the mayors, Chamber of Commerce representatives, and health officers of the various cities. In his address at the national gathering, the President gave figures which indicate a direct monetary expense of around $2,000,000,000 a year for sickness in the United States, or an average family cost of $80 a year through the loss of wages, salaries, cost of necessary medical care, and the like. In addition, the total capital value of lives prematurely lost has been estimated as aggregating over $6,000,000,000 annually. There is evidence to indicate that modern public health work has already been actively stimulated by the contest. (*Amer. Jour. of Public Health*, June, 1930.)

POLIOMYELITIS

An unusual prevalence of poliomyelitis was experienced in many states in 1930. The outbreak first became apparent in Southern California where, out of 1,110 cases in the state, there were 935 cases reported in 8 counties between Jan. 1 and the middle of September. The 1930 outbreak started in June, about one month earlier than the 1927 outbreak.

The disease increased in August in other parts of the United States, spreading to the middle west and northeastern coast. Fewer infants than usual contracted the disease, but more individuals over 20 years of age were affected. In general, convalescent blood serum was used more frequently and earlier than in previous outbreaks, but it is too early to draw conclusions regarding the results.

PSITTACOSIS

The most serious epidemic of psittacosis thus far recorded occurred during the winter of 1929-30. The number of cases reported through February throughout the world reached nearly 400, with a mortality of about 35 per cent. In the United States, there were 74 foci of infection, with 169 cases and 33 deaths between Nov. 23, 1929, and May 7, 1930. All outbreaks of this disease have been connected with the handling of parrots and other similar wild birds. It seemed established that the present outbreak was the result of a large shipment of parrots from Paraguay and Brazil, many of which died on the way to dealers and many more after having been distributed widely throughout the world. The incubation period of the disease is from 8 to 15 days. (*Jour. A. M. A.*, Vol. 94, No. 22, May 31, 1930, p. 1762, and *Public Health Reports*, U.S.P.H.S., Aug. 29, 1930.)

MENTAL HYGIENE

The First International Congress on Mental Hygiene was held in Washington in May. On this important occasion, there was issued a Special International Congress Number of *Mental Hygiene*, the official publication of the National Committee for Mental Hygiene, 370 Seventh Avenue, New York. This valuable publication opens with a chapter on "Finding a Way in Mental Hygiene" and includes a section devoted to the pioneers in this field. Ninety-one pages are devoted to book reviews of unusual interest.

COSTS OF MEDICAL CARE

The Committee on the Costs of Medical Care has completed its first three years of work, and the 1930 report of the chairman, Ray Lyman Wilbur, M.D., outlines the progress and the future program. A program of 35 studies has been adopted. The survey will cost over a million dollars. Several important reports have been published and others are appearing periodically. Three principles have been adopted by the Committee, as follows: 1. The personal relation between physician and patient must be preserved in any effective system of medical service; 2. The concept of medical service of the community should include a systematic and intensive use of preventive measures in private practice and effective support of preventive measures in public health work; 3. The medical service of a community should include the necessary facilities for adequate diagnosis and treatment.

(The First Three Years' Work of the Committee on the Costs of Medical Care and its Plans for the Future, spring meeting, 1930, 910 Seventeenth Street, Washington, D. C.)

VITAL STATISTICS

By T. F. Murphy
Chief Statistician for Vital Statistics, U. S. Bureau of the Census

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FEDERAL STATISTICS

Federal mortality and birth statistics are compiled for only that part of the United States known as the "death registration area" and the "birth registration area." (Mortality Statistics and Birth, Stillbirth, and Infant Mortality Statistics—annual reports—published by the Bureau of the Census.) A "registration area" is that portion of the United States recognized by the Federal Government as having adequate registration laws, and at least 90 per cent complete registration. In 1929 the death registration area included 46 states, the District of Columbia, the Territory of Hawaii, the Virgin Islands, and 9 registration cities in non-registration states, or 95.7 per cent of the total population, while the birth registration area, composed of these 46 states, the District of Columbia, the Territory of Hawaii, and the Virgin Islands, included 94.7 per cent of the total poulation. The following tables show the state growth of these two areas:

STATES IN DEATH REGISTRATION AREA

Table A

State	Year	State	Year	State	Year
Massachusetts ...	1880[1]	Ohio	1909	Nebraska	1920[1]
New Jersey		Minnesota	1910[1]	Georgia[7]	1922
Dist. of Columbia[2].		Montana		Idaho	
Connecticut	1890[1]	North Carolina[5] ..		Wyoming	
Delaware[3]		Utah		Iowa	1923
New Hampshire ..		Kentucky	1911	North Dakota...	1924
New York		Missouri		Alabama	1925
Rhode Island		Virginia	1913	West Virginia..	
Vermont		Kansas	1914	Arizona	1926
Maine	1900[1]	North Carolina[6] ..	1916	Arkansas	1927
Michigan		South Carolina ...		Georgia[7]	1928
Indiana	1900	Tennessee	1917	Oklahoma	
California	1906	Illinois	1918	Nevada	1929
Colorado		Louisiana		New Mexico....	
Maryland		Oregon			
Pennsylvania	1906	Delaware	1919		
South Dakota[4]....		Florida			
Washington	1908	Mississippi			
Wisconsin					

[1] Census Year.

[2] Included in states.

[3] Dropped from the area in the census year 1900.

[4] Dropped from the area in 1910.

[5] Included only municipalities having a population of 1,000 or more in 1900.

[6] The remainder of the State of North Carolina was added to the registration area in 1916. (See note 5.)

[7] Dropped from the area in 1925 when state registration law was declared unconstitutional; under a new law, the state was readmitted in 1928.

Death Rates.—The death rate of the registration area for 1929 was 11.9 per 1,000 estimated population. Of the 1,386,363 deaths which occurred in the death registration area in 1929, more than 61 per cent were due to eight causes: Diseases of the heart, influenza and pneumonia, cancer, nephritis, cerebral hemorrhage and softening of the brain, tuberculosis, bronchitis and broncho-pneumonia, and diabetes mellitus. The death rate from accidents (excluding automobile accidents) declined from 60.9 per 100,000 population in 1920 to 57.6 in 1929, but the death rate from automobile accidents (excluding collisions with railroad trains and street cars) increased from 10.4 to 23.3.

STATES IN BIRTH REGISTRATION AREA

Table A

State	Year Admitted
Connecticut	1915
Maine	
Massachusetts	
Michigan	
Minnesota	
New Hampshire	
New York	
Pennsylvania	
Rhode Island[1]	
Vermont	
Dist. of Columbia[2]	
Maryland	1916
Indiana	1917
Kansas	
Kentucky	
North Carolina	
Ohio	1917
Utah	
Virginia	
Washington	
Wisconsin	
California	1919
Oregon	
South Carolina[3]	
Nebraska	1920
Delaware	1921
Mississippi	
New Jersey	
Illinois	1922
Montana	
Wyoming	
Florida	1924
Iowa	
North Dakota	
West Virginia	1925
Arizona	1926
Idaho	
Alabama	1927
Arkansas	
Louisiana	
Missouri	
Tennessee	
Colorado	1928
Georgia	
Oklahoma	
Nevada	1929
New Mexico	

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[1] Dropped from the registration area in 1919; readmitted in 1921.
[2] Included in registration states.
[3] Dropped from the registration area in 1925; readmitted in 1928.

CAUSE OF DEATH

Cause of Death	Death Rate per 100,000 Estimated Population in the Registration Area in Continental United States								
	1900	1910	1920	1924	1925	1926	1927	1928	1929
All causes (exclusive of stillbirths)	1,775.0	1,496.2	1,303.8	1,173.0	1,184.1	1,225.4	1,143.4	1,206.6	1,191.9
Typhoid and paratyphoid fever	35.9	23.5	7.8	6.7	8.0	6.5	5.5	4.9	4.2
Malaria	7.9	2.2	3.6	2.4	2.1	1.9	2.7	3.6	3.5
Smallpox	1.9	0.4	0.6	0.9	0.7	0.4	0.1	0.1	0.1
Measles	12.5	12.3	8.8	8.5	2.3	8.2	4.1	5.4	2.5
Scarlet fever	10.2	11.6	4.6	3.1	2.7	2.5	2.3	2.0	2.1
Whooping cough	12.1	11.4	12.5	8.2	6.7	8.9	6.9	5.5	6.3
Diphtheria	43.3	21.4	15.3	9.3	7.8	7.5	7.8	7.2	6.6
Influenza and pneumonia	181.5	115.1	153.4	76.1	84.7	99.5	66.4	103.9	109.6
Erysipelas	5.1	4.5	3.1	2.5	2.4	2.6	2.4	2.4	2.5
Meningococcus meningitis	(1)	0.4	1.6	1.0	1.1	1.3	1.6	2.6	4.5
Tuberculosis of the respiratory system and acute disseminated tuberculosis	181.8	139.7	100.6	79.5	77.2	78.0	72.6	71.5	69.0
Other forms of tuberculosis	20.1	20.6	13.4	10.1	9.5	9.3	8.4	7.8	7.0
Cancer and other malignant tumors	83.0	76.2	83.2	91.1	92.8	95.1	95.7	96.1	95.9
Diabetes mellitus	9.7	14.9	16.0	16.4	16.9	18.0	17.5	19.0	18.8
Cerebral hemorrhage and softening, embolism and thrombosis (not cerebral)	75.5	79.4	86.2	93.6	86.6	89.2	87.5	91.5	91.6
Diseases of the heart...	132.1	158.8	159.1	176.5	185.7	199.5	196.0	208.2	210.8
Bronchitis and bronchopneumonia	67.6	70.5	67.7	47.8	45.2	50.6	39.2	44.8	42.3
Diarrhea and enteritis[2].	133.2	117.4	54.3	34.5	39.4	33.6	27.6	26.9	23.5
Appendicitis and typhlitis	9.7	11.4	13.4	14.8	15.2	15.0	15.0	15.3	15.2
Hernia, intestinal obstruction[3]	12.2	12.4	10.6	10.5	10.8	11.2	10.5	10.5	10.6
Cirrhosis of the liver...	12.9	13.9	7.1	7.3	7.3	7.2	7.5	7.6	7.2
Acute and chronic nephritis	89.0	99.1	89.2	88.8	96.5	98.5	92.6	95.2	91.2
Puerperal septicemia ...	5.7	7.2	6.6	5.7	5.5	5.3	5.3	5.0	5.0
Other puerperal causes.	7.6	8.5	12.5	9.6	9.3	9.1	8.5	8.8	8.2
Congenital malformations and diseases of early infancy	91.8	88.1	86.7	77.6	74.0	71.7	67.8	65.8	62.4
Suicide	11.5	16.0	10.2	12.1	12.1	12.8	13.3	13.6	14.0
Homicide	2.1	5.9	7.1	8.4	8.6	8.8	8.8	8.8	8.5
Automobile accidents[4] ..	(1)	1.8	10.4	15.5	17.1	18.0	19.6	20.8	23.3
Automobile and railroad-train collision	(1)	(1)	(1)	(1)	1.2	1.5	1.5	1.8	1.7
Automobile and street-car collision	(1)	(1)	(1)	(1)	0.5	0.4	0.4	0.5	0.4
Other external causes..	79.0	82.6	60.9	60.2	59.7	58.9	57.0	56.3	55.5
Unknown or ill-defined diseases	73.8	23.1	17.7	17.5	17.4	17.8	17.6	20.6	20.9

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[1] Not separately tabulated.
[2] From 1900 to 1920 includes ulcer of the duodenum.
[3] From 1900 to 1920 includes adhesions of intestines.
[4] Excludes deaths from collision with railroad trains and street cars.

DEATH REGISTRATION AREA: 1880-1929

Year	Estimated population, July 1, of Continental United States	Registration Area in Continental United States					
		Estimated Population, July 1		Land Area		Deaths from All causes [1]	
		Number	Per Cent of Total	Square Miles	Per Cent of Total	Number	Rate per 1,000 Population
929	121,526,429	116,317,515	95.7	2,634,743	88.6	1,386,363	11.9
928	119,861,607	114,258,516	95.3	2,402,433	80.8	1,378,675	12.1
927	118,196,785	108,177,568	91.5	2,274,398	76.5	1,236,949	11.4
926	116,531,963	104,938,301	90.1	2,221,892	74.7	1,285,927	12.3
925	114,867,141	102,951,999	89.6	2,108,072	70.9	1,219,019	11.8
924	113,202,319	100,082,062	88.4	2,091,456	70.3	1,173,990	11.7
923	111,537,497	97,816,104	87.7	2,021,237	68.0	1,193,017	12.2
922	109,872,675	93,866,240	85.4	1,965,589	66.1	1,101,863	11.7
921	108,207,853	89,102,434	82.3	1,726,012	58.0	1,032,009	11.6
920	106,543,031	87,632,592	82.3	1,726,012	58.0	1,142,558	13.0
919	105,003,065	85,166,043	81.1	1,649,281	55.5	1,096,436	12.9
918	103,587,955	81,333,675	78.5	1,546,166	52.0	1,471,367	18.1
917	102,172,845	74,984,498	73.4	1,349,629	45.4	1,068,932	14.3
916	100,757,735	71,349,162	70.8	1,307,819	44.0	1,001,921	14.0
915	99,342,625	67,095,681	67.5	1,228,704	41.3	909,155	13.6
914	97,927,516	65,813,315	67.2	1,228,644	41.3	898,059	13.6
913	96,512,407	63,200,625	65.5	1,147,039	38.6	890,848	14.1
912	95,097,298	60,359.974	63.5	1,106,777	37.2	838,251	13.9
911	93,682,189	59,183,071	63.2	1,106,734	37.2	839,284	14.2
910	92,267,080	53,831,742	58.3	997,978	33.6	805,412	15.0
909	90,691,354	50,870,518	56.1	765,738	25.7	732,538	14.4
908	89,073,360	46,789,913	52.5	725,117	24.4	691,574	14.8
907	87,455,366	43,016,990	49.2	603,151	20.3	687,034	16.0
906	85,837,372	41,983,419	48.9	603,066	20.3	658,105	15.7
905	84,219,378	34,052,201	40.4	212,744	7.2	545,533	16.0
1904	82,601,384	33,345,163	40.4	212,744	7.2	551,354	16.5
903	80,983,390	32,701,083	40.4	212,762	7.2	524,415	16.0
902	79,365,396	32,029,815	40.4	212,762	7.2	508,640	15.9
901	77,747,402	31,370,952	40.3	212,770	7.2	518,207	16.5
1900	75,994,575	30,765,618	40.5	212,621	7.1	539,939	17.6
1900[2]....		28,807,269	37.9	176,878	5.9	512,669	17.8
1890[2]....	62,947,714	19,659,440	31.2	90,695	3.0	386,212	19.6
880[2]....	50,155,783	8,538,366	17.0	16,481	0.6	169,453	19.8

[1] Exclusive of stillbirths.

[2] Census year ending May 31.

Birth Rates.—The birth rate of the birth registration area in continental United States for 1929 was 18.9, or 0.9 lower than the corresponding rate for 1928 and the lowest since the establishment of the area in 1915. The death rate for the birth registration area was 11.9, indicating the rate of natural increase for 1929 to be 7.

Infant Mortality Rates.—The 19 infant mortality rate (deaths of i fants under 1 year of age per 1,0 live births) was 68 or 1 lower tha the corresponding rate for 192 While the rate for 1929 is still higher than the record low rate (6 for 1927, it is, nevertheless, the se ond lowest rate since the establis ment of the area in 1915.

BIRTH REGISTRATION AREA: 1915-1929

Year	Birth Registration Area in Continental United States								
	Population[1]		Land area		Births[2]		Deaths[2]		Deat of Infan under year age p 1,00 Live Birth
	Number	Per cent of United States Total	Square Miles	Per cent of United States Total	Number	Rate per 1,000 Population	Number	Rate per 1,000 Population	
1915	30,936,179	31.1	292,860	9.8	776,304	25.1	436,593	14.1	100
1916	32,788,670	32.5	302,801	10.2	818,983	25.0	486,682	14.8	101
1917	54,771,416	53.6	794,819	26.7	1,353,792	24.7	776,222	14.2	94
1918	55,515,241	53.6	794,819	26.7	1,363,649	24.6	996,627	18.3	101
1919	61,483,423	58.6	1,075,506	36.2	1,373,438	22.3	798,104	13.0	87
1920	63,740,689	59.8	1,152,314	38.7	1,508,874	23.7	836,134	13.1	86
1921	70,738,177	65.4	1,209,224	40.7	1,714,261	24.2	825,511	11.7	76
1922	79,415,841	72.3	1,508,946	50.7	1,774,911	22.3	938,545	11.8	76
1923	80,694,406	72.3	1,508,946	50.7	1,792,646	22.2	992,237	12.3	77
1924	86,256,025	76.2	1,689,576	56.8	1,930,614	22.4	1,006,994	11.7	71
1925	87,486,096	76.2	1,683,103	56.6	1,878,880	21.5	1,030,518	11.8	72
1926	89,682,479	77.0	1,880,267	63.2	1,856,068	20.7	1,093,511	12.2	73
1927	103,575,656	87.6	2,139,894	72.0	2,137,836	20.6	1,176,805	11.4	65
1928	113,050,663	94.3	2,402,186	80.8	2,233,149	19.8	1,361,987	12.0	69
1929	115,097,972	94.7	2,634,510	88.6	2,169,920	18.9	1,369,757	11.9	68

[1] Estimated July 1. Population from 1920 to 1929 are revised, based on the 1920 an 1930 censuses.

[2] Exclusive of stillbirths.

COGNATE SOCIETIES

Alliance Against Food Fraud, 300 Madison Ave., New York City.

Allied Dental Council, 425 Lafayette St., New York City.

American Academy of Applied Dental Sciences, 587 Fifth Ave., New York City.

American Assn. for Medical Progress, 370 Seventh Ave., New York City.

American College of Surgeons, 40 E. Erie St., Chicago, Ill.

American Gynecological Society, 104 S. Michigan Ave., Chicago, Ill.

American Heart Assn., Inc., 370 Seventh Ave., New York City.

American Institute of Homeopath 393 Seventh Ave., New York Cit

American Laryngological Assn 1811 Spruce St., Philadelphia, P

American Laryngological, Rhin logical and Otological Societ Inc., 145 W. 58th St., New Yor City.

American Medical Assn., 2 E. 103r St., New York City.

American Occupational Therap Assn., 175 Fifth Ave., New Yor City.

American Opthalmological Societ 2213 Walnut St., Philadelphia, P

American Osteopathic Assn., 84 Rush St., Chicago, Ill.

merican Physiological Society, Rockefeller Institute, New York City.
merican Society for the Control of Cancer, 25 W. 43rd St., New York City.
merican Society of Clinical Pathologists, 256 Metropolitan Bldg., Denver, Colo.
merican Veterinary Medical Assn., 716 Book Bldg., Detroit, Mich.
ssn. of American Medical Colleges, 25 E. Washington St., Chicago, Ill.
ssn. of Military Surgeons of the U. S., Army Medical Museum, Washington, D. C.
merican Society of Tropical Medicine, Box 131, Penn. Ave. Station, Washington, D. C.
orgas Memorial Institute, 1598 Madison Ave., New York City.
arcotic Drug Control League, Inc., 40 Wall St., New York City.
ational League for Nursing Education, 370 Seventh Ave., New York City.
National Tuberculosis Assn., 370 Seventh Ave., New York City.
New York Academy of Medicine, 2 E. 103rd St., New York City.
New York Academy of Sciences, 77th St. and Central Park West, New York City.
Osteopathic Aid Assn., 103 Park Ave., New York City.
Public Health Committee, 2 E. 103rd St., New York City.
Society of American Bacteriologists, Cornell University, Ithaca, N. Y.
Society of Medical Jurisprudence, 2 E. 103rd St., New York City.
Southern Medical Assn., Empire Bldg., Birmingham, Ala.
United Board of Health Control, Inc., 233 Broadway, New York City.
United Hospital Fund, 105 E. 22nd St., New York City.
United States Hay Fever Assn., Bethlehem, N. H.

DIVISION XXIV

PHILOSOPHICAL AND SOCIAL SCIENCES

PHILOSOPHY

By A. A. Roback

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EXPOSITION

In the philosophic curve or chart, if one may apply the figure to a sphere so abstract and timeless, the year 1930 shows an upward trend, or perhaps better a deviation from the conventional mode which cannot be set down in quantitative terms. To summarize briefly the nature of this deviation, we might first of all point to the fact that America is actually becoming of age, so to speak, in a cultural sense. The award of the Nobel Prize, for the first time in its history to an American in the field of literature is only one of many indications that the Old World is beginning to reckon with the achievements of Americans in other than practical and experimental pursuits. While it is true that American philosophy is still held to be in the disciple category rather than in the master class it is at least no longer held in contempt, and in the new edition of Ueberweg's *History of Philosophy*, adequate space is given in the bibliography to American writings.

AMERICAN CONTRIBUTIONS TO PHILOSOPHY

Contemporary American Philosophy.—The American contribution to philosophy has not yet received its full mead of recognition, but the two volumes on *Contemporary American Philosophy* presenting autobiographical exposition of thirty-four representatives of American thought in line with similar productions both in Germany and England give evidence of considerable intellectual activity. It is surprising, however, that this work should have been published primaril in England. The question as t whether Santayana is to be regarde as a European or as an America which must needs puzzle a reviewe has been decided by the committe which proposed the members of Th American Philosophical Associatio Perhaps the most interesting paper i this collection of human document is Prof. G. H. Palmer's vivid description of the period, which some like t refer to as the Golden Period i American philosophy.

American Philosophy in Europe—Aside from the sustained interes in James' writings in France an latterly the Scandinavian countrie and Germany, we note in Italy som partiality toward the idealism o Royce. F. Albeggiani, *e.g.* has recently published a book entitled *I sistem filosofica di Josiah Royce* (Palermo). In Germany, Prof. Weise has been giving in the University o Berlin a course on the "Place o America in the Cultural Picture o Our Time." (*Die Bedeutsamkeit Amerikas innerhalb des Kulturganzen unserer Zeit.*) The organization of an international philosophical society an the founding of the *Forum Philosoph cum* by Dr. Raymund Schmidt hav been made possible largely throug American coöperation. This periodica which prints articles in several different languages, numbers over 100 subscribers in the United States, indicating that this country harbors goodly number of people willing t dabble at least in abstract things American participation in the Sevent International Congress of Philosoph is another sign of healthy growth. I ll probability there were more merican participants than those of ny other nationality. One-fifth of the apers read belonged to Americans, overing an extensive range of subects. This leads to the consideration f another hopeful sign in the philoophical progress of America, and hat is the diversification of theme.

Diversity.—Perhaps the problems n philosophy never grow old; peraps even the changes which one occaionally notes are only verbal, but it ust be admitted that judging from he titles of new books, there is not o much hankering after old themes, hich formed the nubbin of controersy between two different philosohies. On the whole, a more positivstic note has been introduced. The pecial sciences have been cultivated, nd philosophers are reaching out nto affiliated fields for suggestions.

METAPHYSICS

Santayana and Strong.—Curiously nough, the two philosophers who ave been living for many years in urope away from the academic atosphere, have never ceased busying hemselves with the older problems f metaphysics albeit decked out in ttractive garb. Both C. A. Strong nd George Santayana have brought ut important books during the year, ut that is no reason why they should e associated here, nor even because hey chose to give up their academic bode for Southern climes, but rather ecause they seem in their ideology o complement each other. The one s an idealist for whom matter is a hing to be explained away; the other s a materialist who wonders why here should be such prejudice against atter in all its configurations. trong's *Essays on the Natural Origin f the Mind* (Macmillan) is a sequel o his early work *Why the Mind Has Body.* Santayana's new book, *The ealm of Matter* (Scribner) is virtully the second volume of his *The ealms of Being.* The poetic language f Santayana as usual is a relief to he reader, but it obscures much of he thought, which is acute enough, hough rather out of date when the ransformation in modern science has shorn the older problems of a great deal of significance. In dealing with the prejudices against matter, he seems to be combating a point of view no longer existing at least in this form. The most stimulating chapter in the book is the one in which he discusses the difference between objects and objectives, facts and preferences. In tone, the book sounds like an eloquent sermon on behalf of materialism. To the literary mind it will be not only impressive but profound; the philosophic mind in search of ideas and closely reasoned conclusions it will strike as a brilliant pamphlet.

Fite.—The answer to at least some of Santayana's contentions will be found in *The Living Mind* (Dial) by W. Fite, who pleads for consciousness and wants it to be considered as an integral part of reality. The books by Strong, Santayana and Fite offer a good many contacts for discussion and the three of them, although written from different standpoints, display an element of scholasticism in approach, even reminiscent of the dispute between the nominalists and realists in the Middle Ages.

HISTORY OF PHILOSOPHY

Text books on the history of philosophy have become scant of late, but J. M. Warbeke has written an excellent book, primarily for students, called *The Searching Mind of Greece* (Crofts). Its chief quality lies in the freshness of the style and the spirited attack. *The Book of Diogenes Laertus: Its Spirit and Method* (Columbia Univ.) by R. Hope is a scholarly piece of research which should throw some light on the personality of this critical spirit, but also on the great figures in Greek philosophy whom he would discuss.

Scholastic Period.—We must record E. McDougall's *A Study of Personal Religion* (Smith) and in modern philosophy, the monograph by J. Ratner *Spinoza on God* (Holt) may be mentioned. Naturally many books, such as Whewell's *Philosophy of Induction* will be treated under more specific rubrics.

EPISTEMOLOGY

Logic and Methodology.—This department which has held its own in the United States for a number of years does not show the same comparative strength in 1930. Perhaps the best works of the year on the subject of Methodology are M. C. Swabey's *Logic and Nature* (N. Y. Univ.) and H. H. Dub's *Rational Induction* (Univ. of Chicago). These may be regarded as textbooks rather than treatises though the arrangement of the material differs from that of the conventional text. O. L. Reiser's *Humanistic Logic* (Crowell) exhibits a pragmatistic coloring, while S. K. Langer's *The Practice of Philosophy* (Holt) rests on the foundations of Whitehead's philosophy and the principles of mathematical logic.

Theory of Knowledge.—In his Carus lectures, *The Revolt against Dualism* (Open Court), A. O. Lovejoy, continues the method of John Locke in his enquiry concerning Ideas. *Cogitans Cogitata* (Univ. of California), is the title of a book of lectures by H. W. Carr, who has been visiting professor at the University of Southern California for the past three years. S. S. Brown has written a monograph called *A Pragmatist Theory of Truth and Reality* (Princeton Univ.).

Aesthetics.—The year has been especially fruitful in works on aesthetics and the philosophy of art. D. W. Prall's *Aesthetic Judgment* (Crowell) is of a kind with Santayana's *Sense of Beauty*, but Prall introduces relevent considerations which did not occur to the former. C. T. Ducasse has written *A Philosophy of Art* (Crowell); L. Grudin attempts to approach the whole field of beauty from a logical observation point in his popular *Primer of Aesthetics* (Covici-Friede) while the most philosophical grasp of the subject may be perceived in H. H. Parkhurst's *An Interpretation of Art and the Imaginative Life* (Harcourt, Brace).

Political Philosophy.—There has been a considerable output in the social and political phases of philosophy. Two solid works which deserve attention are *Theory of Legislation* (Progress) which is concerned with the working of the public mind, and *The Ethical Basis of Political Authority* (Macmillan) a work which is almost the counterpart of the former mentioned. A more popular presentation of the same problems, handled in a more conventional manner is E. D. Martin's *Liberty* (Norton). Still more popular and written from a socio-psychological angle is *King Mob* (Harcourt, Brace) by F. Notch. In *Individualism Old and New* (Minton, Balch) John Dewey pleads for a cultural substitute to take the place of the old loyalties which the modern individual, as a result of the intensified industrial system, has lost as a personal factor.

Ethics and Value. — Although ethics is not represented by many works during the year, the few that may be recorded are of a high quality. To this class belong W. M. Urban's *Fundamentals of Ethics, Introduction to Moral Philosophy* (Holt) and, to a less extent, *The Meaning of the Moral Life* by W. N. Nevius (Noble). The values and the subject of axiology in general have received more attention in 1930 than usual. H. O. Eaton has given a lucid exposition of the Austrian school in economics and philosophy in his *Austrian Philosophy of Values* (Univ. of Oklahoma) while L. R. Ward has written *The Philosophy of Value* (Macmillan). From a scholastic angle, L. R. Ward in *An Essay in Constructive Criticism* (Macmillan) has argued for the inherence of value in the object, not merely in the relation, true not actual value but at least potential, in that the object might be sought. An outline of an interest theory of value is contained in *The Human Perspective* (G. Williams).

PHILOSOPHY OF RELIGION

There has never been a dearth in books on religion but solid works on the subject are comparatively rare. The output during 1930 may be said to be remarkable in that philosophers from different viewpoint have attacked the problems of religion in a philosophical light. There are *e.g.* W. P. Montague's *Belief Unbound*

(Yale Univ.). W. Riley's *The Meaning of Mysticism* (Smith) is a scholarly work differing in scope from the works of James and Leuba on that subject. *The Problem of God* (Abingdon) by E. S. Brightman is a personalistic treatment of religion, teleology and metaphysics. A Thomistic view is elaborated in F. J. Sheen's *God and Intelligence in Modern Philosophy* (Longman's Green). N. F. Standing's *Spirit in Evolution from Amoeba to Saint* (Dial) is a sort of modern version of Drummond's *Spiritual Law*, etc. Finally, mention may be made of H. H. Brinton's *The Mystic Will* (Macmillan) which is at least suggestive, if not convincing.

POPULAR PHILOSOPHERS

Voltaire.—We must not omit listing a few of the more scholarly works on thinkers who exerted a great influence on the intellectuals of the world, but who were not philosophers in the technical sense of the word. *Voltaire and the English Deists* (Yale) is an interesting account of the intellectual relations between the French rationalist and his English co-religionists, so to speak.

Carlyle and Emerson.—M. Storrs has dwelt on the relation of Carlyle to Kant and Fichte, (Bryn Mawr). F. J. Carpenter's book on *Emerson and Asia* (Harvard Univ.) shows what Emerson means for the East.

Wickham.—In a book called *The Unrealists* (Dial) H. Wickham discusses pseudo-critically the philosophy of James, Bergson, Santayana, Russell, Dewey, Alexander and Whitehead as well as the system of Einstein. As in previous books, the author does not make any attempt to digest the works he impugns and lumps under one blanket label of philosophers who are *toto colo* different from one another.

John Dewey.—Echoes of the Dewey anniversary resound in *John Dewey, The Man and His Philosophy* (Harvard Univ.) a series of addresses delivered in New York on the occasion of his seventieth birthday. In the second semester of 1931, John Dewey is scheduled to deliver ten public addresses as the first incumbent of the William James lectureship at Harvard University endowed by the bequest of the late Edgar Pierce.

Whitehead.—The Butler medal award in gold every five years by Columbia for the most distinguished contribution during a five-year period anywhere in the world to philosophy or educational theory, was awarded in 1930 to A. N. Whitehead for his "critical reinterpretation of classic systems of Modern Thought" as well as for his philosophical analysis of natural science and metaphysics of the organism.

UNIVERSITY OF SOUTHERN CALIFORNIA

The philosophical activity which has characterized of late the University of Southern California has culminated on the material side in the dedication of a New Hall of Philosophy, June 5, 1930, and on the intellectual side its first fruits have been the publication of a series of classics in philosophy, which have hitherto been neglected in America. Condillac's *Treatise on the Sensations* and Leibniz's *Monadology* in toto, not merely selections, have already appeared, the latter with an introduction, commentary and supplementary essays.

EUROPEAN PHILOSOPHY

The main interest for Americans in European philosophy lies in phenomenology. At least half a dozen articles have appeared on this subject in the periodicals during the year. The reason for this stress is primarily that Husserl's school still attracts students from America. Of French philosophy, the views of Emile Meyerson have latterly been discussed in American journals.

PSYCHOLOGY

By Wilbur S. Hulin

Professor, Princeton University

CURRENT TENDENCIES

American psychology is closely allied with the biological sciences. The problems of adaptability to the environment, and the development of response mechanisms have continued to receive a large share of attention. The *conditioned reflex* studies of the Russians have been tested and amplified in many American laboratories, The analysis of experience has been continued in terms of underlying physiological conditions and has been checked against the sensory capacities of animals by the behavioristic method. Purely introspective studies, however, are not lacking. The phenomenalogical descriptions of the German *Gestalttheorie* have been subjected to a rigorous examination.

AMERICAN PSYCHOLOGICAL ASSOCIATION

Annual Meetings of the Association were held at the University of Iowa, Dec. 29-31, 1929. The sessions devoted to animal psychology and to child psychology proved to be in many ways the most productive features of the convention. The white rat continues as the most popular subject of investigation for the animal experimentalists. New studies are in progress on the possibility of the inheritance of a general alertness or of "feeble mindedness" in the rodents. In the discussion of children, evidence was given that the only child is not so handicapped in his social integration as has often been suspected. The Presidential Address, delivered by Prof. H. S. Langfeld, considered the value of "A response interpretation of consciousness."

"Response Theory."—Among the various tendencies in psychology which have been followed in a trial-and-error manner, there is an old theory which is still in the making. This is the "response" theory. The former term of "motor" theory of consciousness emphasizes merely the efferent side of the nervous arc, and is inadequate for the true picture of the living, conscious individual. A straight stimulus-response behaviorism is a valuable method, but it is not a complete system. There is always a need for the interpretation of significant relations between the actions of the organism and consciousness. There is evidence that behavior is essential to consciousness, and that consciousness exhibits a conformity with behavior. Thus, recent authors, such as W. Stern and C. Goldstein, declare that there is no perception without adjustment. Recent attacks on cerebral localization indicate the importance of considering the entire organism in the occurrence of conscious processes. Among older authorities the James-Lange theory of emotions stands as a strong argument for the response aspect. Examples of the part played by response are found in emphatic actions, in the proprioceptive stimulations of postural tonus, in conditioned responses as the basis for association, and in the integrated configurations of activity resulting from training.

Theories and Schools.—*The Psychologies of 1930*, edited by C. Murchison, represents the most comprehensive survey of the year on psychological theories and schools. While the volume is international in scope, fourteen of the twenty-five contributors are American scientists. W. McDougall brings forward the evidence favoring "hormic," or purposive psychology, a view which opposes the materialistic explanation of life and mind. H. Carr outlines the thoroughly American school of "functional" psychology which grew from the teachings of such men as James Dewey, Hall and Ladd. M. F. Washburn describes her own system of "motor" psychology. M. I. Bentley and E. G. Boring both express a wholesome spirit of eclecticism; both recommend that scientific facts be examined according to their natural experimental setting rather than interpreted according to some particular system. An historical account of the Titchenerian school of introspective, or "structural" psychology is given by J. P. Nafe. Köhler, Koffka and Sander discuss the several aspects of configurational, or *Gestalt* psychology. The three leading Russian schools of "reflex" psychology are presented in a comparable form for the first time in the English language by Pavlov, Schniermann and Kornilov, all members of U.S.S.R. universities. The range of behaviorism, from anthroponomy to biosocial interpretations, is sketched by W. S. Hunter and A. P. Weiss. K. Dunlap's "response" psychology and R. S. Woodworth's "dynamic" psychology, while inclined toward behaviorism, are more eclectic in spirit, and include a ready use of introspective observations. Following the exposition of systems, a series of problems fundamental to all psychology are discussed. These include inheritance, abnormal traits, intelligence, etc. (Clark Univ. Press, 1930.)

PHYSIOLOGICAL PSYCHOLOGY

Brain Functions.—A thoroughgoing study of the history of physiological psychology has been completed by F. Fearing: *Reflex Action* (Williams & Wilkins, 1930). This is one of the two or three best books on the subject. Localization of brain functions is constantly debated. Some authorities consider that the brain only reveals a mass action of nerve conduction; others present evidence for high specificity of centers. From the latter viewpoint F. A. Gibbs indicates "the relationship between the location of brain tumors and their manifestations" (*J. Nerv. & Ment. Diseases*, October, 1930). In "a consideration of Lashley's theory of the equipotentiality of cerebral action," W. S. Hunter argues that the evidence from maze learning, in which there are many kinds of stimuli, contradicts Lashley's notion of a central neural engram (*J. Genet. Psych.*, October, 1930).

Nerve Impulse.—H. Hoagland believes that "the Weber-Fechner law and the all-or-none theory" are consistent with each other, that is, increased intensity of stimulation corresponds to increased frequency of nerve impulse (*ibid*, July 1930). C. Landis declares that many physiological tests such as the galvanic reflex, blood volume, etc., have failed because they have been measured against vague psychological entities such as emotions, "psychology and the psychogalvanic reflex" (*Psych. Rev.*, September, 1930). J. C. Whitehorn similarly criticizes "the alleged correlation of intelligence with knee jerk reflex time" (*J. Exper. Psych.*, June, 1930). The same conclusions are reached by L. E. Travis and C. W. Young on "reflex time and intelligence" (*J. General Psych.*, July, 1930), and by R. A. MacFarland on the "relationship between speed and mental ability" (*ibid*, January, 1930).

Conditioned Reflex.—A. L. Winsor indicates that "secretory inhibition" occurs not only in the salivary glands but also in the other major nutritive glands (*Psych. Rev.*, September, 1930). M. Smith points out the vagueness of "Pavlov's conception of the unconditioned response" (*ibid*). It has long been thought that a conditioned reflex could only be established by presenting first the substitute stimulus and then the natural stimulus, but S. A. Switzer has accomplished a "backward conditioning of the lid reflex" (*J. Exper. Psych.*, February, 1930). "Conditioning as a principle of learning" is accepted by E. R. Guthrie as the neural equivalent for all mental processes which in older times were subsumed under the principle of association by contiguity (*Psych. Rev.*, September, 1930), and H. S. Razran makes a further identification between "conditioning and related phenomena," such as the "insight" of *Gestalt* psychology (*ibid*, January, 1930).

Relation of Physique and Intellect.—A book which should strike popular fancy, and yet which presents a scientifically reliable account of the relations between physique and intellect has come from D. G. Paterson. The influence of glands, digestion and other organic characteristics upon one's personality and mental alertness are described. However, concerning many common notions the writer is iconoclastic. F. G. and C. G. Benedict show that "the energy requirements of intense mental effort" as measured by metabolic changes are very small as compared with the great sense of fatigue which the subject often experiences (*Nat. Acad. Sci.*, June, 1930). A series of researches by Laird and Muller show the relative importance of such factors as blood distribution, relaxation and metabolism upon sleep (John Day, 1930). F. H. Lund has found that a blindfolded person will veer to the right or to the left according to a difference in the development of the legs. This observation may explain the circular courses taken by persons who are lost in darkness or in snowstorms: "Physical asymmetries and disorientation" (*Amer. J. Psych.*, January, 1930).

SENSATION AND FEELING

Experiments.—The great experiments in psychology have been gathered together in a condensed form by H. E. Garrett and are now accessible to readers moderately trained in psychology who desire a better understanding of the scientific sources of the modern concepts. Recent and older experiments have been included. Some of the experiments described are: the development of the Binet and the Army scales of intelligence; Ebbinghaus's memory studies; Thorndike and Köhler's animal experiments; the rise and progress of psychophysics of sensory capacity; Galton and Cattell's measurements of individual differences; Franz and Lashley's analyses of cerebral function (Century, 1930).

Sensory Capacity.—In the psychophysical measurements of sensory capacity new evidence continually appears showing that the general attitude and training of an individual alters the exact amounts of sensory discrimination measured. Thus, J. F. Humes has found an "effect of practice upon the upper limen for tonal discrimination" (*Amer. J. Psych.*, January, 1930). O. D. Anderson, however, was unable to establish constant "observational attitudes" even with specific instructions (*ibid*, July, 1930). Yet S. W. Fernberger reports a "constancy of attitude" for lifted weight judgments over a period of five years (*ibid*, April, 1930).

Sense Organs.—The second volume of L. T. Troland's *Psychophysiology* has appeared. Volume II is entitled *Sensation;* the discussion of vision is particularly authoritative (Van Nostrand, 1930). "The mechanism of the sense organs" is being studied in terms of the impulses from individual nerves which are measured by means of the thermionic amplifier; a review of the results obtained in recent years has been communicated to the American Physiological Society by E. D. Adrian (*Physiol. Rev.*, April, 1930).

Vision.—One of the constant perplexities in the study of vision has been treated by E. Murray in her discussion on "color problems: the divergent outlook of physicist and psychologist," in which she shows that fixed mathematical relations of wave lengths do not always correspond to the changes in experience. (*Amer. J. Psych.*, January, 1930). C. F. Schofield has demonstrated that the alleged "perception in the region of the optic disk" is due to the diffusion of light by the refracting media of the eye (*ibid*, April, 1930). M. Meenes has given "a phenomenological description of retinal rivalry," showing a spatial and textural difference between the dominating and the passive fields of the two eyes (*ibid*). M. J. Zigler and others find that in the "perception of form in peripheral vision" there is a gradation from the extreme outer field of "figureless" vision, through a zone where formless figures are perceived, to the inner region of clear figure perception (*ibid*). Increase in the "intensity of light and speed of vision" are correlated with moderate intensities only, according to C. E. Ferree and G. Rand (*J. Exper. Psych.*, October, 1930). A large body of data concerning the inheritance of color-blindness has been collected by C B. Davenport, who also emphasizes the need of a repository of family histories: "Sex linkage in man" (*Genetics*, September, 1930). By use of photographic records S. K. Chon shows that reading-direction is not a hindrance to eye movements in the "legibility of Chinese characters" (*J. Exptr. Psych.*, August, 1930). A new perception of "visual and auditory thickness" has been discovered by E. R. Moul (*Amer. J. Psych.*, October, 1930).

Audition.—By placing electrodes on the exposed auditory nerve of the cat, E. G. Wever and C. W. Bray have observed the responses set up through stimulation of the ear by sound. A correspondence between frequency of the sound and the frequency of the nerve response has been demonstrated: "The nature of acoustic response" (*J. Exper. Psych.*, October, 1930). From an introspective analysis C. C. Pratt shows that the "spatial character of high and low tones" exists as a real phenomenon, and may be significant for the physiology of audition (*ibid*, June, 1930). Experimenting "on Mayer's 'residual sonorous sensation'" H. G. Bishop finds that these tonal after-sensations aid in the appreciation of harmonics derived from interrupted tones (*Amer. J. Psych.*, January, 1930). Using an oscillograph, I. C. Young and R H. Stetson have made an "analysis of vowels"; this method allows a rapid comparison of a large number of examples (*Science*, August, 1930).

Other Senses.—Some causes of "chronic headache" are reported by E. R. Carpenter (*Med. J. & Rec.*, October, 1930). In an "analysis and synthesis of burning heat" S. C. Ferrall and K. M. Dallenbach have again shown that "heat" is a combination of warm and cold sensations (*Amer. J. Psych.*, January, 1930). A. H. Sullivan and D J. Verda find that "the experiential fusion of warmth and cold in heat" is not necessarily a part of the pressure-pain continum because the experience can be aroused just as well when the temperature stimuli do not touch the skin (*J. Exper. Psych.*, April, 1930). D. Katz has reviewed the recent observations of "the vibratory sense," a mode of experience which seems to be different from ordinary tactual sensation (*Maine Univ. Bull.*, 1930). F. W. Hazzard makes a "descriptive account of odors" which tends to substantiate Henning's smell prism except that the principle odors, those that seem psychologically simple, have different degrees of affinity or remoteness to each other (*J. Exper. Psych.*, August, 1930). An interesting innovation has been offered by S. L. Crawley in his syllabus for *Experimental Psychology* by the introduction of experimental topics such as "human urges and motivation," "personality," etc (Holt, 1930).

Feelings.—"Pleasant and unpleasant feelings" should continue to be treated as unique processes despite the fact that many psychologists now group them with sensations. H. Cason points out that history is full of activities characterized by strongly unpleasant feelings and emotions (*Psych. Rev.*, May, 1930). P. T. Young has continued his "studies of affective psychology" in the hope of developing a standard test of the feelings which would have the same diagnostic value as that obtained from the Knet-Rosanoff association test (*Amer. J. Psych.*, January, 1930). J. Frois-Wittmann has prepared a valuable new set of photographs for "the judgment of facial expression." The investigator has tested this group of pictures for the relations between faces judged as expressing similar emotions and the similarities of muscular patterns involved in these expressions (*J. Exper. Psych.*, April, 1930).

COMPARATIVE PSYCHOLOGY

Heredity.—The battle concerning instincts rages and D. Q. Marquis offers a "criterion of innate behavior" based on the proposition that maturation results from inter-cellular stimulations while learning comes from extra-organic stimuli (*Psych. Rev.*, July, 1930). G. E. Coghill makes a compromise: the "genetic interrelation of instinctive behavior and reflexes" is found in the autonomy of an organism throughout its life history (*ibid*, May, 1930). H. S. Jennings presents new evidence for inheritance in his book, *Biological Basis of Human Nature* (Norton, 1930). More evidence comes from T. S. Painter's review of "recent work on human chromosomes" (*J. Hered.*, February, 1930), and from N. D. M. Hirsh's book on *Twins: Heredity and Environment* (Harvard Univ. Press, 1930).

Animal Studies.—There is a widespread tendency for experimenters in animal psychology to take inventory of the progress in their field. Critical evaluations of the flood of literature which has appeared in the last decade are numerous. Problems of technique are paramount. P. T. Young has summarized the report of the committee on "precautions in animal experimentation" (*Psych. Bull.*, February, 1930). The most important of the "determining factors of maze-performance" of rats is "knowledge"—the maze should be of a type which is adaptable to the natural habits of the animal; the two aspects of "reward-value"—drive and actual reward—are next in importance (*Amer. J. Psych.*, April, 1930). Among the investigations of low animal forms is that by M. Copeland on "an apparent conditioned response in (the clam worm) *nereis virens"*; the worm was trained to approach a light, in opposition to its natural tendency, in order to obtain food (*J. Comp. Psych.*, August, 1930).

LEARNING AND MEMORY

Learning experiments, until recent times, have been directed toward the association of one unit of ideas or activities to another unit. This point of view is now changed, due largely to the influence of *Gestalt* psychology, as is illustrated by the experiment of F. T. Perkins and R. H. Wheeler on "configurational learning in the goldfish" (*Comp. Psych. Monog.*, March, 1930). L. F. Shaffer and others have compiled a series of *Learning Exercises* which are based on a more exact knowledge of mental functions than have been employed in many popular books on the same subject (Harper & Bros., 1930). W. F. Book has also compiled a helpful "anaylsis of the task of learning to read" (*J. Educ. Research*, January, 1930). Accepting purposive behavior as the foundation of learning, E. Collings and M. O. Wilson present a *Psychology for Teachers* (Scribners, 1930). K. Dunlap has performed several experimental demonstrations showing the effectiveness of enforced "repetition in the breaking of habits" (*Sci. Monthly*, January, 1930). Learning by "whole and part methods with unrelated reactions" has given identical results, according to L. W. Crafts (*Amer. J. Psych.*, October, 1930). G. Humphrey believes that "learning and the living system" are both processes of organic equilibrium (*Psych. Rev.*, November, 1930). Memory is greatly influenced by the feelings, although there are "individual differences in forgetting pleasant and unpleasant experiences": H. Meltzer (*J. Educ. Psych.*, September, 1930).

CHILD PSYCHOLOGY

Genetic problems are being pushed to the earliest periods of life. O. C. Irwin describes "the amount and nature of activities of newborn infants under constant external conditions during the first ten days of life" (*Genet. Psych. Monog.*, July, 1930). *Child Development*, a new journal, edited by B. Johnson and others, began in 1930. C. Bühler writes on *The First Year of Life* (John Day, 1930). E. J. Swift, another author of wide experience, writes on *The Psychology of Childhood* (Appleton, 1930). Comparing the "mentality of a child with that of apes," P. Brainard has found that a three-year-old child has the same difficulties in solving problems as did Köhler's apes (*J. Genet. Psych.*, June, 1930). D. A. McCarthy describes "the language development of the pre-school child" (Univ. Minn. Instit. Child Welfare Monog., 1930), and B. W. DeBusk discusses the "persistence of language errors among school children" (Univ. Oregon Publ., 1930). P. V. Sangren has devised *Information Tests for Young Children* (World Book Co., 1930). The third volume of L. M. Terman's *Genetic Studies of Genius*, called *The Promise of Youth*, continues the follow-up studies of a thousand gifted children which has been carried on for over a decade. Terman believes that some of the attention devoted to subnormal children might profitably be turned to the study of exceptional children (Stanford Univ. Press, 1930). In a study of "modern youth and the movies" T. E. Sullenger has found a spontaneous approval expressed for highly moral standards. Mystery and war plays are the favorites of the children around nine and ten years of age (*School & Soc.*, October, 1930). S. R. Leahy and E. J. Fox find no "effect of the emotions on the intelligence quotient." This supposed source of error does not seem to vary for any individual in repeated tests (*J. Juv. Research*, October, 1930).

SOCIAL PSYCHOLOGY

The progress of civilization entails an increasing overhead of incompetent individuals who cannot meet the exacting standards of culture and industrial competition. Every year new efforts are made to determine just how useful and just how helpless the unfortunate persons are. S. P. Davies has treated this question in his book, *Social Control of the Mentally Deficient* (Crowell, 1930). K. Young's *Social Psychology* represents one of the outstanding contributions of the year in this field. The book is composed largely of observational analyses of social behavior. (Knopf, 1930). A new periodical, the *Journal of Social Psychology*, has appeared under the editorship of J. Dewey and C. Murchison. Political, racial and differential psychology are treated. The preparation of an *Encyclopedia of the Social Sciences* has been started under the editorship of E. R. A. Seligman and A. Johnson. The first two volumes appeared in 1930 (Macmillan). The First International Congress on Mental Hygiene was held in Washington, D. C., May 5-10, 1930, under the presidency of Dr. W. A. White. A case book on *Methods in Social Science*, by S. A. Rice, describes the statistical and psychological technique required (Univ. Minn. Press, 1930). A Freudian approach to political questions dealing with agitators, radicals, adminstrators, etc., has been attempted in H. D. Laswell's *Psychopathology and Politics* (Univ. Chicago Press, 1930). In a "symposium on psychopathology" I. S. Wile has discussed "functional disease as a personality disorder," M. G. Earle has described the difficulties of dealing with the "defense reactions of pyschopaths," etc. (*Med. J. & Rec.*, June, 1930). The psychoanalysts point to the pathological origins of many unhappy conditions in everyday life. Thus I. H. Coriat shows that "active therapy in the analysis of stammering" reveals the presence of conflicts which will yield to treatment (*Psychoanal. Rev.*, July, 1930). A. Adler's two books of the year are *Problems of Neurosis* and *The Pattern of Life*. Both are popular presentations of psychoanalytic doctrines (Cosmopolitan Book Corp., 1930).

APPLIED PSYCHOLOGY

The field of applied psychology has been greatly advanced by the Personnel Research Federation which includes in its staff W. V. Bingham, C. S. Slocombe and others. The Federation coöperates with the American Federation of Labor and similar organizations. A survey of the Federation's work has been reported in *The Personnel Journal*, October, 1930. Tests by W. S. Larson show that the "measurement of musical talent for the prediction of success in instrumental music" may be made with fair reliability for certain traits such as the ability to discriminate pitch (*Psych. Rev. Monog.*, No. 181, 1930). P. E. Vernon has proposed "a method of measuring musical taste" by correlating the preferences of amateurs and professionals (*J Appl. Psych.*, August, 1930). D. B. Lucas and C. E. Benson have found from "some sales results for positive and negative advertisements" that certain medicines, health appeals and self-improvement courses benefit by the negative type (*ibid*). J. F. Dashiell has decided that there is no significant relation between "personality traits and the different professions"; the prime requisite is training (*ibid*, June, 1930). This decision is substantiated by the general trend of vocational aptitude tests which exhibit an increasing effort to elicit tests of significant units of response while generalized concepts, such as personality, are relegated to the limbo whence many of the vague generalities of the other sciences have gone. Every phase of psychology must undergo the same minute scrutiny and experimental verification required by the other exact sciences!

SOCIOLOGY

By Frank H. Hankins

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CONFERENCES

American Sociological Society.—This body held its twenty-fifth annual meeting at Cleveland, Dec. 29-31, 1930. The officers for 1930 were: Howard W. Odum, University of North Carolina, president; Edwin H. Sutherland, University of Chicago, first vice-pres.; Dwight Sanderson, Cornell University, second vice-pres., Ernest W. Burgess, University of Chicago, secretary-treasurer. While the main theoretical topic for the meetings was "Social Conflict," special sessions were held for the usual divisional groups, papers were read on the historical and theoretical aspects of sociology, teaching and research. At one of the sessions special tribute was paid to the late Prof. Charles H. Cooley of the University of Michigan. At the annual meeting, it was voted thereafter to issue the *Publications* of the Society as a quarterly in February, May, August and November. The May issue contains a full report of papers read at the previous December annual meetings. The February issue reports the official activities of the Society; the August number will be devoted to the list of members; and the November issue announces the program for the forthcoming annual sessions. November 30, 1929, the membership of the Society numbered 1530, a gain of 178 over the previous year.

The Eastern Sociological Conference held its organizing sessions at Brown University, May 3-4. It was instigated by Professors Clarence G. Dittmer, New York University. Harold S. Bucklin, Brown University, and M. C. Elmer, Pittsburgh University. Its purpose is to give opportunity for more intimate discussion of current problems than is possible at the crowded sessions of the national society. Its membership is inclusive of teachers of sociology in the New England and Middle Atlantic states. Officers were elected as follows: F. H. Hankins, Smith College, President; C. G. Dittmer, Vice-president; H. A. Phelps, Brown University, Secretary-Treasurer; and additional members of the executive committee: H. P. Fairchild, New York University; P. A. Sorokin, Harvard University; and M. C. Elmer. The next sessions will be held at Yale University in the spring of 1931.

GENERAL WORKS

Methods and Status of Scientific Researches with Particular Applications to the Social Sciences by W. E. Spahr and R. J. Swenson (Harper) is a work of general interest to all students of social sciences. *Principles of Rural Urban Sociology* by P. Sorokin and C. C. Zimmerman (Holt) is an erudite compendium of extant information on the differences between urban and rural populations in occupation, environment, size, density, composition and social differentiation, with considerable emphasis on such physical differences as stature, pigmentation, cephalic index, suicide rates, births and deaths. *Trends in American Sociology* edited by G. A.

Lundberg, Reed Bain and Nels Anderson, is a work of ten collaborators dealing with the history, trends, prospects and theories of sociology in general and with reference to psychology, cultural evolution, urban and rural communities, education and social work. *Reading in Sociology*, by Wilson S. Wallis and Malcolm M. Willey (Knopf) covers a wide range of topics but centers around the concepts of social change and the culturistic approach to problems of individual personality, race and institution. The selections were somewhat unique in that few of them were taken from widely known books and many from sources requiring special search and discrimination. *Principles of Sociology* by Edward A. Ross (Century) is an extensively revised edition of a work first issued ten years ago. In addition to the omission of fourteen of the original chapters and the addition of sixteen new ones, the work is marked by some alteration in theoretical viewpoints: the instinct type of psychology has been discarded; much greater use has been made of the findings of cultural anthropologists; and increased importance has been attached to processes of social selection in relation to class and individual differences. Other revisions of well-known texts included *Outlines of Sociology*, by J. L. Gillin and F. W. Blackmar (Macmillan) and *Sociology* by Edward C. Hayes. (Appleton.) Both works were extensively revised. The second, though based on the author's text of 1918 is largely a new work with a new title. *Social Organization* by Frederick A. Bushee (Holt) is an introductory text divided into three main divisions: first, an introductory section dealing with the study of sociology, the forms and purposes of social groups and modern trends in social grouping; second, the main body of the work, dealing with various forms and types of organization; and third, a study of the interrelations of social institutions. *Toward Civilization*, a symposium edited by Charles A. Beard (Longmans, Green) is a collection of essays by engineers and scientific experts on the significance of science for the evolution of modern culture; in general, it is contended that science and its applications have already exerted a beneficent influence on cultural evolution and that the evils they may have created along with others for which they are not responsible can be resolved only by further applications of scientific knowledge. *The Biological Basis of Human Nature* by H. S. Jennings (Norton), contains material of interest to the sociologist, not only in its general elucidation of genetic theory, but in its special chapters dealing with the genetic basis of personality and individual differences, biological fallacies and human affairs, eugenics, the biological basis of marriage and the family, race mixture and the inheritance of acquired characters. *A Study of Acculturization in the Polish Group of Buffalo, 1926-1928* by Niles Carpenter and Daniel Katz (Univ. of Buffalo) investigates the processes of assimilation; *Delinquency Areas: A Study of the Geographical Distribution of School Truants, Juvenile Delinquents, and Adult Offenders in Chicago* by Clifford R. Shaw (Univ. of Chicago Pr.) is a contribution to the literature of criminal sociology in which the areas of delinquency in a great urban center are pointed out; it is shown that areas of high delinquency have been such for a long time, tend to remain so in spite of population shifts and are the main centers for recruiting criminal recidivists. *An Introduction to Human Problems* by Harold Benjamin (Houghton Mifflin) is designed for orientation courses for college freshmen. *Proceedings of the National Conference of Social Work, 1929* (Univ. of Chicago Pr.) contains papers on every phase of modern social work.

POPULATION PROBLEMS AND VIEWPOINTS

Corrado Gini and Others, *Population* (Univ. of Chicago Pr.), a series of addresses on the Harris Foundation giving a valuable discussion of current problems and viewpoints. Warren S. Thompson, *Danger Spots in World Population* (Knopf), indicating the danger to world peace due to the growing pressure of population, especially in Japan, India and Italy, and suggesting that parts of the present colonial possessions of Great Britain, France and the Netherlands would be more effectively utilized if opened to unrestricted migration from congested areas. Warren S. Thompson, *Population Problems* (McGraw-Hill), a comprehensive treatment of both quantitative and qualitative aspects of population in a form suitable for text-book uses. *The Fecundity of Native and Foreign-Born Women in New England* by J. J. Spengler (Brookings Inst.) concludes that the fecundity of native women has not diminished during the last fifty years, while that of the foreign-born has diminished greatly; and the fecundity of the latter has always been greater than that of the former, but that this fact is now due mainly to the greater proportion of married among the foreign-born women. *Birth Registration and Birth Statistics in Canada* by R. R. Kuczynski (*Ibid.*) continues that author's illuminating studies in modern vital statistics. *Twins: Heredity and Environment* by N. D. M. Hirsch (N. Y.: Oxford) is a contribution to the relative influence of heredity and environment in the production of individual differences. In the same category belongs *Learning and Growth in Identical Twins. An Experimental Study by the Method of Co-Twin Control.* (Clark Univ. Pr.). *Seventy Birth Control Clinics* by Caroline H. Robinson (Baltimore: Williams and Wilkins) is not merely a survey of the rapidly developing movement for the establishment of birth control clinics throughout this country but a valuable contribution to many aspects of population questions as well. *Factors in the Sex Life of Twenty-two Hundred Women* by Katherine B. Davis (Harper) is an invaluable summary of various questionnaires. By far the largest proportion of those answering her questions were college graduates able to realize the importance of the matters under question and free from many of the traditional taboos. The book throws a unique and invaluable light on many of the intimate problems of sex in the modern age.

BIRTH CONTROL

Birth control is probably the most significant cultural movement now affecting the future development of western culture and the relative positions of nations, classes and religions. It is in this country an important factor in race substitution because, in the eastern and northern states at least, it is more extensively practised by the native population than by the foreign born; it is a factor in religious change because it is practised more by the less religious than by the more religious, more by Protestants than by Catholics. Moreover, it is very probably affecting the quality of the population through the differential fertility of the social classes. Recent events have evidenced a more general rcognition of its importance and inevitableness and hence a tendency to place it on a more constructive basis in relation to problems of both population quantity and racial quality. It has received express approval by various bodies of physicians in different parts of the country. The year was notable for the endorsement of the principle of family limitation by various religious bodies including the general convention of the Universalist Church, the Central Conference of American Rabbis, the New York East Conference of the Methodist Episcopal Church and the Southern California Conference of the same denomination, and the American Unitarian Association. It was qualifiedly endorsed by the Presbyterian General Assembly meeting at Cincinnati, not for total prevention of births but for family regulation. Mention should be made here also of the resolution of the Southwestern Branch of the American Association for the Advancement of Science meeting at Tucson, April 23, condemning federal laws placing limitation on the use of the mails for the discussion of problems of sex and human reproduction and pledging support for their repeal so as to permit the legal dissemination of literature of a strictly scientific or medical character.

Leagues for the promotion of birth control legislation, clinics and information have been formed in a number of states and cities. Under the leadership of Mrs. Margaret Sanger a National Committee on Federal Legislation for Birth Control was formed to support a bill to be introduced in the forthcoming session of Congress permitting physicians to prescribe contraceptive measures. A western conference on birth control and population problems was held at Los Angeles, Feb. 20-23, 1930. March 3 the U. S. Circuit Court of Appeals reversed the decision of the previous year whereby Mrs. Mary Ware Dennet was sentenced for circulating through the mails her pamphlet *The Sex Side of Life.* This pamphlet was originally written by her for the instruction of her sons and her right to circulate it was upheld largely on the ground of her moral sincerity and high purpose.

THE NEGRO IN AMERICAN LIFE

Literature dealing with the Negro in American life has increased enormously since 1920. This is an indication that the social and economic position of America's colored population has entered a new phase. This is connected with the service of the negro in the war, the check of immigration with the consequent movement of hundreds of thousands of negroes northward and their infiltration into many basic industries, the growth of negro urban centers in New York, Detroit, Philadelphia, Chicago and elsewhere in the north, and the changes in negro status in the south attendant upon the processes of industrialization and urbanization. An important work dealing comprehensively with many aspects of negro vital statistics and culture is *The Negro in American Civilization* by Charles S. Johnson (Holt). Another work of general interest includes the third edition of *The Negro in Literature and Art* by Benjamin Brawley (Duffield), a compendium of negro authors and artists with some interpretation and appraisal of their products. *The Negro Peasant Turns Cityward* by Louise V. Kennedy (Columbia University Press), is a comprehensive study of one of the new phases of negro life. *The Rural Negro* by Carter G. Woodson (Washington, Association for study of Negro Life and History), is an authoritative study of its subject. Among new local studies of negro life may be mentioned: *Black Yeomanry* by T. J. Woofter, Jr. (Holt), a study of the complete life cycle of a pure Negro Community on St. Helena Island off the coast of South Carolina; *The Negro in Charlottesville and Albemarle County* by Marjorie F. Irwin (University of Virginia); *The Negro in Richmond, Virginia,* by June P. Guild (Richmond, Council of Social Agencies), a study showing that negroes in this city live fifteen years less on an average than whites, suffer three times as many arrests and are handicapped by fourteen times as much illiteracy, and utilizing such data for the discussion of a program for social betterment. *The Housing of Negroes in Washington, D. C.* by William H. Jones (Howard University Press) studies the characteristics and changes of residence in the capital city. *Negro Membership in American Trade Unions* by Ira Reid (New York, National Urban League) is a significant study of a contentious matter.

GEOGRAPHY AND SOCIOLOGY

There has been, notably since the war, a rapid increase in community of interest between students of geography and students of sociology. The older anthropogeography centering in Germany dealt very largely with the distribution of races and the significance of physiographical conditions for racial selection and differentiation. A later phase was the development of human geography in France, in which special attention was given to the intensive study of the significance of every detail of topography, climate and resource of special regions for the development of social life. Utilizing the regional concept which views every section of the earth, large or small, as divided into more or less specialized geographical areas, human geography was able to emphasize the influence of geographical factors in the differentiation and fixation of cultural activities. In addition there was developed fresh insight into the significance of air and ocean currents, heat and moisture, plant and animal life, soil and mineral resources for social life in general, for migration of peoples, for cultural diffusion, for political divisions and political and economic power, and for historical events. Since 1920 contributions to this field have been numerous in this country, coming from geographers, economists, anthropologists and sociologists. On the theoretical question whether geographical conditions constitute primary or incidental factors in cultural evolution and historical events there is wide difference of opinion. The geographers tend to magnify their importance while the school of cultural determinists among the anthropologists and sociologists tends to minimize them, when it does not discount them altogether. The truth probably lies near the golden mean. Among recent publications may be mentioned *A New Regional Geography of the World*, by Marion I. Newbigin (Harcourt, Brace 1929.) *Environmental Basis of Social Geography* by C. C. Huntington and Fred A. Carlson, (Prentice Hall), is a study of the reciprocal relations of man and his physical environment.

MARRIAGE AND FAMILY

In *Incompatibility in Marriage* (Appleton) Dr. Felix Adler treats a number of ethical problems relating to marriage, divorce, the revolt against sex mores, and woman's role in determining the quality of marriage. Among other views, he holds that while divorce may ameliorate a mistaken marriage it can never wholly remedy the harm done to the personalities involved; that morality is not merely convention; and that the social importance of marriage gives it a value above the happiness of the individual. *The New Generation: The Intimate Problems of Parents and Children* edited by V. F. Calverton and S. D. Schmalhausen (Macaulay) has an introduction by Bertrand Russel; it is a symposium dealing with various problems arising from the contrasted outlook of young and old with sidelights on new educational theories. *Marriage: Past, Present and Future* by Ralph de Pomerai (N. Y.: Smith) contains a brief discussion of various problems connected with the origin and evolution of the family and an extensive treatment of divorce, reaching the conclusion that the laws of divorce should be simplified, separation abolished, and divorce made procurable at the wish of either party. *What is Right With Marriage: An Outline of Domestic Theory* by Robert C. and Frances W. Binkley (Appleton) is an effort to state and elucidate those problems of personal attraction and adjustment whose solutions are essential if marriage is to be happy and successful. It is at once a comprehensive, fair-minded and illuminating discussion of the modern marital problem. *Love in the Machine Age: A Psychological Study of the Transition from Patriarchal Society* by Floyd Dell (Farrar & Rhinehart) is a very suggestive study of the effects on the whole scheme of folkways and mores relating to marriage and the family of modern industrialism, economic freedom of women and the rise of feminism. *The Evolution of Modern Marriage: A Sociology of Sexual Relations* by F. Miller Lyer, translated by Isabella C. Wigglesworth (Knopf), is one of an incomplete six-volume work prepared by this late distinguished sociologist designed to constitute a comprehensive and systematic sociological treatise from the evolutionary viewpoint; while written a number of years ago it is a treatise of enduring merit. Several 1930 books treating of marriage and sex relations from advanced viewpoints are the following: *Ideal Marriage* by Th. H. Van de Velde (Covici Friede), a work restricted to the recognized professions; *From Marriage to Love* by Josef Loebel (N. Y.: Ives Washburn); *The Modern Attitude to the Sex Problem* by Kenneth Ingram (F. A. Stokes). The first

American clinic for marital problems was opened in the spring of 1930 at Los Angeles as the Institute of Family Relations under the direction of Dr. Paul Popenoe. It is sponsored by the California branch of the American Eugenics Society. More than a hundred such clinics are said to be in successful operation in Europe.

SOCIAL MALADJUSTMENT

The first number of *The Social Work Year Book: 1929*, issued by the Russell Sage Foundation, represents the fulfillment of the desire to have a readily accessible record of the annual achievements in all phases of social work. It is a volume of 600 pages, edited by Fred B. Hall and Mabel B. Ellis and containing contributions from numerous pens. Part I contains 187 topical articles dealing in encyclopaedic manner with such topics as family welfare work, community chests, juvenile courts, probation, immigrants, mental hygiene, dance halls, industrial insurance and many others. Part II contains a comprehensive roster of 452 national social agencies, public and private, including foundations for social work, crime commissions, state conferences, and schools of social work. *American Charities and Social Work*, originally written by Amos Warner many years ago, appeared in its fourth edition at the hands of Stuart A. Queen and Ernest B. Harper (Crowell). A valuable study relating to the financing of the vast range of American humanitarian activities is *Corporation Contributions to Organized Community Welfare Services* by Pierce William and Frederick E. Croxton (N. Y.: Nat'l. Bur. of Econ. Res.) In his *Social Control of the Mentally Deficient*, (Crowell) Stanley P. Davies sets forth the newer views of deficient mentality made necessary by the advance of genetics, the invention of mental testing, the discovery of the moron, and the development of more intelligent ways of education and training. Here may be mentioned also *The Social Adjustment of the Feeble-Minded* by Helen M. Walker and Mary C. Schauffler (Cleveland: Western Reserve Univ. Pr.) *The Jack Roller: A Delinquent Boy's Own Story* by Clifford R. Shaw is the life story of a delinquent who was readjusted to normal social relations by wise guidance under modern psycho-social principles. Two special studies made for the Pennsylvania Committee on Penal Affairs (Philadelphia) by Leon Stern were: *The County Prison of Allegheny County*, and *The Treatment of Adult Offenders and Children in Delaware County, Pennsylvania.* Of similar tenor was *The Juvenile Court of Lackawanna County, Pennsylvania* by Leon Stern and Arthur Dunham (Philadelphia: Public Charities Ass'n) and *The Treatment of Adult Offenders and Children in Luzerne County, Pennsylvania* by the Welfare Council of Wyoming Valley, Wilkes-barre, Pa. *Care of Aged Persons in the United States* (Washington: Gov't. Print. Off.) is a bulletin of the U. S. Bureau of Labor Statistics giving results of a nation-wide survey of homes for the aged, exclusive of almshouses. *Law and Social Work: An Introduction to the Study of the Legal-Social Field for Social Workers* by Jonh S. Bradway (Univ. of Chicago Pr.), is a pioneer work on this rapidly expanding subject. Other studies worthy of notice include *Canadian Penal Institutions* by C. W. Topping (Univ. of Chicago Pr.); *Institutional Care and Placing Out* by Elias L. Trotzkey (Chicago: Marks Nathan Jewish Orphan Home). Two studies relating to the legal disposition of youthful offenders are: *The Juvenile Court in Law and the Juvenile Court in Action* by W. L. Scott (Ottawa: The Canadian Council of Child Welfare); and *Juvenile Division of the Municipal Court of Philadelphia* by the Bureau of Municipal Research of that city.

ANTHROPOLOGY AND ETHNOLOGY

By Bella Weitzner

The American Museum of Natural History

GENERAL SURVEY

Even a cursory survey of the anthropological projects undertaken in a single year cannot fail to impress one with their number, variety, and scope, so that a complete categorical statement of accomplishments would fall far beyond the limits of this summary. The far flung influences of our own civilization have left untouched but few primitive peoples in the world and unceasing effort is being exerted everywhere to record, before the opportunity has passed, the facts of these native cultures. Coincidentally, a stimulating shift in ethnological interest is also taking place in that there is a recognition of the importance of the study of the contact of disparate cultures, or rather, the influence of our own culture on the primitive group. Among the first to recognize this vital anthropological problem was the Institute of Human Relations at Yale University where test studies of this kind were initiated, one on the Menomini Indians having been completed, while another on the Dakota is now well under way. In Canada, also, C. M. Barbeau, under the auspices of the National Museum, has made extensive observations on colonial influences on the Indians of Eastern Canada, studying present-day native handicrafts to attain a better comprehension of aboriginal art and culture.

THE ESKIMO

St. Lawrence Island.—The perennial question as to the peopling of America still has its tantalizing lure, and archaeologists of the Smithsonian Institution, led by Henry B. Collins, Jr., have made repeated visits to St. Lawrence Island in Bering Strait to excavate ancient Eskimo village sites. Thus far, three stages of Eskimo culture have been disclosed through these excavations to which impetus is added by the possibility of finding the skeletal remains of some of the original migrants from Asia to America.

Hrdlicka Studies—In an attempt at the elucidation of the same problem, A. Hrdlicka, the distinguished physical anthropologist of the U. S. National Museum, has continued his investigations of the original Eskimo physical type, and following a visit to an isolated and inaccessible group living on the Kuskokwim River in Alaska has announced that here he has found a physical type, isolated for centuries, which appears to have been the original Eskimo type, from which the Eskimo, as we now know them, were developed. These Eskimo on the Kuskokwim are more like Indians than Eskimo and lack the facial development so characteristic of the Eskimo. These studies were correlated with a study of the skeletal remains of earlier generations of these isolated Eskimo.

THE INDIAN

Archaeological Reconnaissance.—Investigations of living Indians are not so numerous as they have been in the past due in part to the acculturation of the Indian almost everywhere and in part to the arduous work of the past, leaving few groups for which we have no information. Consequently, archaeological undertakings of varying importance loom larger than ever on the anthropological horizon in America. In the United States, for example, archaeological reconnaissance or excavation was carried on in twenty-five states under varying auspices. As for several years in the past, the greatest activity has been in the general Southwestern area the only large district where there has been established a relative chronology based on pottery sequence which has, in turn, been correlated at some key sites, with their actual dating by the timber remains through the tree-ring dating technique evolved by Professor A. E. Douglass.

Southwestern United States.—

Thus, in this region there has been a gradual refinement of the chronological distinctions and constant additions are being reported to add to the weight of evidence bearing on the distribution of the eight known culture periods. Buried under volcanic ash from the last eruption of Sunset Crater, near Flagstaff, Arizona, H. S. Colton has found prehistoric sites representing the Basket Maker period while above the ash were found early Pueblo sites. Along the Canadian River in northern Texas, Doctor J. Alden Mason of the University Museum, Philadelphia, has found evidence of an ancient commingling of Plains Indian and Pueblo cultures as shown by pit-like houses which had had mud and thatched roofs resting on four supporting beams. These houses are of early Pueblo style, but the accompanying pottery is quite unlike Pueblo ware. It is hoped that these sites may be dated by a study of the logs.

Judd Aerial Survey.—Colonel Lindbergh's pioneer aerial archaeological survey in Central America and Southwestern United States last year inspired Neil M. Judd of the United States National Museum to undertake a similar aerial survey of the prehistoric canals in the Gila and Salt River valleys in Arizona. On the basis of his observations he estimates that about four hundrea miles of prehistoric main line canals and laterals were utilized for irrigation in prehistoric Central Arizona. A map was prepared which will form a permanent record of prehistoric conditions.

PREHISTORIC MAN IN AMERICA

Evidence bearing on the antiquity of man in America, whether pointing to a greater or less antiquity, accumulates slowly. Gypsum Cave, near Las Vegas, Nevada, excavated by M. R. Harrington of the Southwest Museum, yielded many well-known pleistocene species, but more important was the finding in every room of the cave, of indications of the association of man with these extinct animals in the form of charcoal, burnt sticks, flint points, and decorated wooden shafts. These were found in the same deposits with the bones and in some cases at lower levels; in one instance, charcoal, probably the remains of a campfire was found between two layers of ground sloth dung about eight feet below the present surface. Though the evidence of the contemporaneity of man and the sloth is not absolutely conclusive, it raises the question as to whether man existed in America twenty or thirty thousand years ago, the time usually assumed for the Pleistocene, or whether some of the Pleistocene animals lived until more recent times, say up to ten or fifteen thousand years ago. No human remains have thus far been found in such association. Several other localities have been reported as containing evidence of very early occupation: Matthew W. Stirling of the Smithsonian Institution has explored caves in Eastern Texas containing traces of human occupation in prehistoric times and it is hoped that further exploration of these caves may aid in tracing the mound builder culture of the Mississippi Valley to a southwestern origin.

MAYA STUDIES

Yucatan.—In the Mexican-Central American field, the Carnegie Institution, always noted for its cooperative efforts, to aid in the interpretation of its finds, is now calling into consultation specialists from many branches of science, A. V. Kidder, directing the archaeological work of the Institution, being responsible for this synthesis. Thus a joint project of the Institution and Harvard University has as its goal the study of the physical type of the present day Maya; an allied study will show their susceptibility to various diseases. Animals and plants of Yucatan are being investigated to learn more of the food of the Maya and the basic materials used in their material and fine arts. Thus, in Yucatan alone, the following cooperative projects are concentrated in this field: the study of Maya language by the University of Chicago; a biological reconnaissance by the University of Michigan; an ethnological reconnaissance by the University of Chicago; clinical records taken at Chichen Itza, a famous Maya city; a medical survey by Harvard University, a pottery survey in the Mayan area; researches on Mayan hieroglyphs by S. G. Morley of the Institution staff; and excavations at Uaxactun, an old Maya city in Guatemala and at Chichen Itza in Yucatan.

City of Uxmal.—The Tulane University Expedition under Dr. Frans Blom reported the discovery at Uxmal, a frequently visited Mayan ruin, of twenty-three groups of buildings hitherto unknown. This expedition discovered also the source of the water supply of the city, as well as a central mound on which stand nineteen date-bearing stelae. Some of the important dates already deciphered, prove that Uxmal dates back to 500 A.D., thus adding to the evidence that the Maya settled Yucatan centuries earlier than had previously been assumed.

Ticoman.—Dr. G. C. Vaillant of the American Museum of Natural History continued his investigations of the so-called archaic cultures of the Valley of Mexico, excavating a site at Ticoman, revealing two cultural phases, the earlier of which it is possible to link up with the third or latest phase at Zacatenco, a nearby site previously studied.

Calixtlahuaca.—A city which flourished before the Spanish Conquest, situated near the modern Otomi Village of Calixtlahuaca, in Mexico, has been explored and preliminary excavations made under a local department of archaeology maintained by the State of Mexico. Here a pyramid, once surmounted by a temple is surrounded by ten smaller pyramids. Thus far, excavation has already revealed that the city was occupied by several successive cultural groups to the time of the Aztec whose pottery remains give evidence of their influence at the end of the period of occupation.

EAST AND NEAR EAST

Shensi Province.—Turning to the eastern hemisphere and to a much earlier period in prehistory, we note that Père Teilhard de Chardin, who with Père Licent, found traces of stone-age culture on the boundaries in the Ordos desert in 1923, has announced the discovery of palaeolithic implements in the eastern part of Shensi Province, along the upper Yellow River, which, according to his statement, offer undisputed proof that man lived in both these regions in Pleistocene times. Father Teilhard declares that the culture is exactly similar to the traces found in the Ordos and comparable to the Mousterian of Europe with which Neanderthal man is associated.

Egypt.—The prehistoric chronology of Egypt is also gradually being correlated with the palaeolithic periods of western Europe, the type gauge for all prehistory. This latest definition of Egyptian prehistoric chronology comes to us through the work of K. S. Sandford and W. J. Arkell of the Oriental Institute of Chicago. The four uppermost and oldest eroded terraces in the Valley of the Nile bear no cultural layers; the fifth, however, has yielded numerous flint implements, which are classifiable as belonging to the Chellean and Acheulian, the oldest western European periods. A sixth terrace reveals Mousterian type implements. No contemporaneous human remains have, as yet, been found here. Below the Mousterian implement-bearing terrace are a series of younger lake terraces, the implements, in which, though assumed to be contemporaneous with those of the various Cro-Magnon cultures of Europe, do not resemble them in appearance.

Dating from about 2000 B. C. to the beginning of the Christian era, one of the greatest undisturbed finds of mummy coffins ever made in Egypt has been reported by Alan Rowe of the University of Pennsylvania Museum expedition. The coffins are stacked in five rooms in a mastabah, or flat-topped tomb structure at Meydum, the great national burial place of the royalty and aristocracy of ancient Egypt. These burials are said to contain the largest known collection of Ptolemaic mummies.

Sinai Desert.—The known Sinaitic inscriptions on stone have been doubled through the efforts of an ex-edition of Harvard University and he Catholic University of America vhich has discovered fourteen Sinatic inscriptions near Sarabit-el-Khalen.

Ur of the Chaldees.—In excavaions made by the joint expedition of he University of Pennsylvania Mueum and the British Museum, under he direction of Leonard C. Wolley, in his the eighth season, every effort was oncentrated on learning more of Ur n the period before the flood. The ldest structural unit yet reached lates back to the early part of the ourth millenium before Christ.

Palestine.—The American School of Prehistoric Research coöperating with the British School of Archaeology in Jerusalem, with Miss D. A. E. Garrod in charge of excavations, has reported additional finds dating from the Aurignacian epoch of the palaeolithic, excavated in one of a group of caves south of Haifa.

Philippines.—Recent excavations by Professor H. Otley Beyer on the Island of Luzon in the Philippines have considerably extended Philippine history backwards into the old stone age. So far, five cultural layers have been defined: Chinese dated at 1000 A. D., an iron age layer, two neolithic layers, and the lowest, representing either a late palaeolithic stage or a transition between this and the neolithic. The iron age implements are partly of native manufacture and there is evidence of native smelting of iron. The forms of these implements are those used in India before the Christian era. Added evidence of trade with India is found in the glass beads and other objects of the same types as the prehistoric finds in southern India.

PEKING MAN

Sinanthropus pekinensis continues to be a subject for discussion and controversy. Dr. Davidson Black, who first described the find, believes that the skull represents a new genus with pre-Neanderthaloid characteristics, though not far removed from the common ancestral stem of Neanderthal and modern man. Dr. A. Hrdlicka disagrees markedly from this opinion since he believes that "Peking Man" does not differ from the recognized Neanderthal type. Portions of a second uncrushed skull of a young adult male of this type have been found in material taken from the cave at Choukoutien about forty miles from Peiping. This second find will supply data on some of the missing portions of the first skull. Black who removed the skull from the matrix of travertine in which it was embedded states that it is about the same length as *Pithecanthropus erectus*, the so-called ape-man of Java, and the indications are that the cranial capacity of Peking Man is about one quarter larger than that of *Pithecanthropus erectus*. Père Teilhard de Chardin, who has reviewed the pertinent geological evidence, affirms that the skull belongs to the early Pleistocene.

MENTAL TESTS

By Frank N. Freeman

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REPORTS AND PUBLICATIONS

The literature on mental tests for 1930 consists chiefly of reports of detailed scientific investigations. No large general treatises have appeared and no radically new types of tests, new methods of testings, or new theories of interpretation have been formulated. The work has consisted in the elaboration of methods which have been formerly worked out, in the criticism of already existent theories and the further development of details of technique. This type of detailed scientific work is necessary for the evaluation of theories which have already been proposed and to lay the groundwork for the formulation of new theories. The publications of the year may be classified under the following heads: description of new tests; studies in the technique of testing; the use of tests for an analysis of the constitution of mental abilities and of mental growth; and the applications of tests to practical problems.

NEW TESTS

Forms and Methods.—While the past year has witnessed no new scales of intelligence of the magnitude and importance of the Binet scale or the Army scale, some attempts to devise new forms have been made. One, for example, is based upon the mental grasp for words and the comprehension of relations between words; another consists of a vocabulary test for pre-school children; a third uses the motion picture as a means of testing adults, and a fourth consists of a new picture test. Each of these tests is the elaboration of a method of testing intelligence applied within a narrow sphere. A somewhat similar type of adaptation consists in a revision of the Stanford-Binet tests for the blind which was made by Hayes. An organization and standardization of previous tests which deserves special mention is Grace Arthur's Scale of Performance Tests. Performance tests are intended to be measures of intelligence without the use of language except in giving the instructions. In some cases they are useful as a substitute for language tests and in other cases as a supplement to them.

Special Aptitudes.—The purpose of another group of tests is to measure some special aptitude. There is need for a large amount of detailed work in the invention, standardization and criticism of tests of special aptitudes. A number of tests have been reported during the past year which are designed to measure mechanical aptitudes. One test has been put out for the measurement of scientific aptitudes or the aptitude for scientific pursuits, and other tests are reported which presumably measure some special aptitude of a sort not defined. One test has been reported which aims to measure not a special aptitude but a more general characteristic of the individual's behavior, namely, the degree of inertia which characterizes his activities.

Behavior and Personality.—The tests which have been described measure abilities of a more or less intellectual character. Another type of test, which has attracted a large amount of effort and attention during the past few years, is designed to measure character, emotion, temperament, interest and such non-intellectual characteristics. As much or more attention is being given to this type of test than to the tests of intellectual abilities, either general or special. These tests deal particularly with the individual's social behavior. One test, for example, is designed to measure the behavior of the individual in situations involving rivalry and coöperation. Another one gives an index of traits of personality; another elaborates various devices for rating character; another aims to place the child on a scale of development in social behavior; another proposes a partially standardized test of social intelligence.

Type Classification.—A number of scales have been proposed for the classification of people into two types, the extravert and the introvert. The validity of this classification is still in question but new scales for making the classification are still coming out. A new test for measuring the emotional characteristics of the individual has appeared. A standardization of a test of children's interests, according to which they may be classified into types, has been published. A new and more elaborate test to measure the prominence of neurotic tendencies in the individual has been brought out. The logical combination of all of these tests of special abilities or particularized traits is a composite test which will compare the individual's abilities or reactions in all these together. Such a test has sometimes been called a profile test. The development of the individual test has probably not gone far enough to warrant the construction of such a profile test but such tests have been proposed in the past and one is described in the literature of the current year.

CONSTITUTION OF MENTAL ABILITY AND GROWTH

Two-factor Theory.—One of the most important outcomes of the use of mental tests consists of the classification of mental abilities and of the relation of different mental abilities to each other, which is to be derived from the scores of the tests and from the statistical manipulation of these scores. The most famous theory of mental abilities which has been derived from mental tests is Spearman's two-factor theory. This has been applied chiefly to the analysis of intellectual ability. A report has recently been published which applies a similar type of analysis to emotional characteristics. This opens up a new field of research.

Study and Analysis.—It might seem to be an easy task to determine whether or not a person is in general slow, or in general rapid in his actions, or whether there is such a thing as a general speed factor. Contradictory reports on this question have been made during the past year. An experiment with three tests of extraversion-introversion, to which reference has already been made, fails to find agreement between the three tests. This disagreement raises the serious question whether it is possible to classify individuals on the basis of this contrast. An elaborate study has been made in England under the auspices of the Industrial Health and Fatigue Board to determine the abilities which are measured by performance tests. Another study has been made for the purpose of analyzing the factors in what is commonly called language ability. The existence of general intelligence has been challenged on the basis of an anlysis of the abilities necessary for success in the various vocations. This analysis is of the so-called subjective type as contrasted with a rigid statistical analysis. An attempt to combine a somewhat subjective psychological analysis with the results of testing has been made by Pieron for the purpose of tracing the mental development of children. Other studies deal with specific questions relating to the child's mental growth, one with the form of the growth curve, another with the form of growth in a specialized ability, and a third with the question whether mental growth continues throughout the period of college life.

TECHNIQUE OF MENTAL TESTING

Scope and Method.—The success of mental testing depends largely upon the development of appropriate forms of technique. Studies in technique occupied a large share of the work during the past year. Some of these studies take the form of the construction of new statistical devices, as, for example, the conversion of scores from one scale into another, or the construction of a method of equating I. Q.'s on several tests. Another somewhat more fundamental problem relates to the question how difficult the test should be. One author holds that tests will differentiate most accurately between individuals when they are at a level of difficulty at which about 50 per cent fail.

Evaluation of Scales.—A considerable number of investigations have dealt with the problem of the evaluation of scales which are already in use. Critical studies have been made, for example, of the Downey Will-Temperament Test, of the Woodworth-Matthews Questionnaire, of the Seashore Music Test, of one of the tests of introversion-extraversion and of others. One author—Adams—has worked out a method of distinguishing between random errors in judgment which may be equally often in one direction as in the other, and constant errors which characterize the judgments of an individual and which are biased in a given direction. A test in which there is more consistency in the judgments of an individual than in the judgments of a group he considers to be characterized by constant errors. A promising method of analyzing tests is reported by a Swedish investigator, Jansson. The method consists in investigating the causes of inadequate constancy of intelligence tests by detailed interviews of children in which the reasons for their answers are brought out. A generally important problem relates to the significance of various types of scores. The best known example is the I.Q. Scores like the I.Q. are designed to indicate the relative ability of the child regardless of his age. Various types of scores to express relative ability have been proposed and used, and an important type of investigation is the evaluation of these scores and the study of their relation to each other.

APPLICATION OF MENTAL TESTS

Comparatively few studies have been made in the field of application of mental tests during the past year or, in any case, few studies have been reported in scientific literature. Tests have been widely applied in the prediction of scholarships in school c
college. Studies were made durin
the year to determine whether men
tal tests give a better prediction tha
other forms of records or whethe
they add to the accuracy of predic
tion made on the basis of previou
scholarships and the like. Anothe
use of tests is for comparison of th
attainment of different racial group
or different environmental groups i
order to determine whether these di
ferences are to be ascribed to inheren
characteristics or to environmenta
influences. As in the past, some c
the studies point in one direction an
some in the other. One study open
up a fruitful line of investigation i
that it attempts to attack the prob
lem not in general but in detail. Sp
cifically, it undertakes to determin
whether children are more or les
suggestible according to the type c
treatment which they have receive
in the home. While this individua
study is probably not conclusive i
suggests an interesting line of attack

COGNATE SOCIETIES

AMERICAN GENETIC ASSN., 306 Victor Bldg., Washington, D. C.
AMERICAN PHILOSOPHICAL SOCIETY, 104 S. 5th St., Philadelphia, Pa.
AMERICAN PSYCHIATRIC ASSN., Albany, N. Y.
AMERICAN PSYCHOPATHOLOGICAL ASSN., 520 Commonwealth Ave., Boston, Mass.
AMERICAN SOCIAL SCIENCE ASSN., 280 Madison Ave., New York City.
AMERICAN SOCIETY FOR PSYCHICAL RESEARCH, 15 Lexington Ave., Ne York City.
AMERICAN SOCIOLOGICAL SOCIETY, 58t St., and Ellis Ave., Chicago, Ill.
ENCYCLOPEDIA OF THE SOCIAL Sc ENCES, 100 Morningside Drive, Ne York City.
NATIONAL COMMITTEE FOR MENTA HYGIENE, 370 Seventh Ave., Ne York City.
PSYCHOLOGICAL CORPORATION, 25 W 39th St., New York City.

PART SEVEN
THE HUMANITIES

DIVISION XXV
LITERATURE AND LANGUAGE

HISTORY

BY ARTHUR M. SCHLESINGER

PROFESSOR, HARVARD UNIVERSITY

SOCIAL AND INTELLECTUAL

Certain tendencies characterized the istoriography of the year: a marked mphasis on American social and inellectual history; an unusual attenion to the historical aspects of reigion; a continued interest in the Vorld War and the new world which as grown out of it. The first two olumes of *The Encyclopaedia of the ocial Sciences* (Macmillan), planned n fifteen volumes under the editorhip of E. R. A. Seligman and Alvin ohnson, issued from the press. Of he continuing coöperative works, H. J. Faulkner, *The Quest for Social ustice, 1898-1914* (XI), and P. W. losson, *The Great Crusade and After, 914-1928* (XII), were added to *A istory of American Life* (Macmilan), edited by A. M. Schlesinger and . R. Fox; *Pre-War America* (Scriber), the third volume of Mark Sulivan's *Our Times*, was published; nd the two concluding volumes of he *Commonwealth History of Massahusetts* (States History Co.), edited y A. B. Hart in five volumes, made heir appearance.

PERIOD HISTORY

Colonial.—American colonial hisory was the subject of study in hristopher Ward, *The Dutch and wedes on the Delaware, 1609-64* Univ. of Pa.); R. B. Morris, *Studies the History of American Law* (Columbia), a path-breaking study; W. M. Gewehr, *The Great Awakening in Virginia, 1740-1790* (Durham: Duke); and Dora M. Clark, *British Opinion and the American Revolution* (New Haven: Yale).

The West and Southwest.—Two new surveys of western development appeared in E. D. Branch, *Westward* (Appleton), emphasizing the romantic aspects; and R. E. Riegel, *America Moves Westward* (Holt), covering much the same ground as Paxson's standard work. Of a more limited scope were: S. O. Henry, *Conquering Our Great American Plains* (Dutton), marred by a controversial attitude; William and G. H. Banning, *Six Horses* (Century), a record of stage-coach days; A. J. Dickson, ed., *Covered Wagon Days* (Cleveland: Clark), describing an actual journey; W. R. Gillis, *Gold Rush Days with Mark Twain* (Boni); C. F. Lummis, *Flowers of Our Lost Romance* (Houghton), dealing with the Spanish-American Southwest; E. R. Forrest, *Missions and Pueblos of the Old Southwest* (Cleveland: Clark), the first comprehensive treatment of the subject; Bourke Lee, *Death Valley* (Macmillan), an account of its early history; R. L. Duffus, *The Santa Fe Trail* (Longmans), its pre-railway development; Grant Foreman, *Indians and Pioneers* (Yale) treating of conditions in the Southwest before 1830;

and H. W. Clark, *History of Alaska* (Macmillan), a short, readable account.

Reconstruction Era.—Renewed interest in the era of Reconstruction was responsible for H. K. Beale, *The Critical Year* (Harcourt); G. F. Milton, *The Age of Hate* (Coward); and H. C. Warmoth, *War, Politics and Reconstruction* (Macmillan), interesting because written by the carpetbagger governor of Louisiana.

RACIAL

Various racial ingredients in the American melting pot received attention in Cornelius Weygandt, *Red Hills* (Univ. of Pa.), concerned with the Pennsylvania Dutch; Christine A. Galitzi, *A Study of Assimilation among the Roumanians in the United States* (Columbia); Eng Ying Gong and Bruce Grant, *Tong War!* (N. L. Brown), an historical sketch of organized Chinese lawlessness in America; C. S. Johnson, *The Negro in American Civilization* (Holt), dealing mainly with contemporaneous conditions; Louise V. Kennedy, *The Negro Peasant Turns Cityward* (Columbia, a scholarly study of recent migrations to northern centers; J. W. Johnson, *Black Manhattan* (Knopf), the Negro in New York City since colonial times; and C. G. Woodson, *The Rural Negro* (Wash.: Assoc. for Study of Negro Life), a sociological survey.

HUMANITARIAN

Humanitarian enterprises were studied historically in M. E. Curti, *The American Peace Crusade, 1815-1860* (Durham: Duke); Devere Allen, *The Fight for Peace* (Macmillan), treating the whole period since 1815; H. E. Barnes, *The Story of Punishment* (Boston: Stratford); and Jane Adams, *The Second Twenty Years at Hull House* (Macmillan), a sequel to her well-known earlier account.

ECONOMIC

The rôle of labor was treated in Eugene Staley, *The History of the Illinois State Federation of Labor* (Univ. of Chicago), and H. L. Childs, *Labor and Capital in National Pol tics* (Ohio State Univ.). P. M. War burg, *The Federal Reserve Syster* (Macmillan), is a historical docu ment of first importance.

LEGAL AND CONSTITUTIONAL

Of legal and constitutional studie the following were noteworthy: W. Munro, *The Constitution of th United States* (Macmillan), a con cise, illuminating commentary; E. Bates, *This Land of Liberty* (Har per), tracing suppressions of individ ual and political liberty; Feli Frankfurter and Nathan Greene, *Th Labor Injunction* (Macmillan), a authoritative study; Roscoe Pound *Criminal Justice in America* (Holt) collected lectures; H. M. Wriston *Executive Agents in American For eign Relations* (Johns Hopkins); an D. F. Fleming, *The Treaty Veto o the American Senate* (Putnam).

INTELLECTUAL AND EDUCATIONA

Intellectual trends and contribution were considered in C. W. Dreppard *Early American Prints* (Century) tracing the development of the ar of engraving to the Civil War; Wil Ransom, *Private Presses and Thei Books* (N. Y.: Bowker), European a well as American; G. P. Schmidt *The Old-Time College President* (Co lumbia), studying the office and influence of the college executive, 1760 1860; E. W. Knight, *Education in th United States* (Ginn), an historica survey; Thomas Woody, *History o Women's Education in the Unite States* (2 vols., N. Y.: Science), scholarly and exhaustive; Victor Rosewater, *History of Coöperative News Gathering in the United State* (Appleton), accurate and comprehensive; and J. E. Chamberlain, *The Boston Transcript* (Houghton), a newspaper biography along conventional lines.

LOCAL HISTORY

Local history had its innings chiefl in the pages of the journals and proceedings of the many regional historical societies. Among the bette books appearing in this field were S. E. Morison, *Builders of the Bay Colo* *y* (Houghton); M. A. DeWolfe Iowe, *Bristol, Rhode Island* (Harard); Ida S. Proper, *Monhegan* Portland: Southworth); and H. C. Kittredge, *Cape Cod* (Houghton).

FOREIGN HISTORY

Latin America received its usual hare of attention in such volumes s S. G. Inman, *Trailing the Conquisadores* (Phila.: Missionary Educ.), lealing with the Caribbean in a popuar style; L. B. Simpson, *The Enomienda in New Spain* (Univ. of alif.), a painstaking study of enorced labor, 1492-1550; F. R. Hart, *he Disaster of Darien* (Houghton), cholarly and concise; J. F. Cady, *ntervention in the Rio de la Plata, 838-50* (Univ. of Pa.), a careful nonograph; Max Winkler, *Investnents of United States Capital in atin America* (Boston: World eace), an encyclopedic treatment; nd C. L. Jones, H. K. Norton and . T. Moon, *The United States and he Caribbean* (Univ. of Chicago), epresenting differing points of view.

Ancient and Mediaeval.—Among he works in ancient and mediaeval istory may be noted R. B. Doughrty, *Nabonidus and Belshazzar* Yale), dealing with the close of the eo-Babylonian empire; and C. H. askins, *Studies in Mediaeval Culure* (Oxford: Oxford Univ.), a colection of previously printed essays.

Modern.—More modern aspects of uropean history were dealt with n Preserved Smith, *The Great Reewal, 1543-1687* (Holt), the first olume of a projected *History of odern Culture; Essays in Intellecual History* (Harper), written by ormer students of James Harvey obinson; M. A. Shaaber, *Some orerunners of the Newspaper in ngland, 1476-1622* (Univ. of Pa.); . L. Langer, *The Franco-Russian lliance* (Harvard); Mary E. Townend, *The Rise and Fall of Germany's olonial Empire, 1884-1918* (Macmilan); H. W. Puckett, *Germany's omen Go Forward* (Columbia); armen Haider, *Capital and Labor nder Fascism* (Columbia); and W. I. Chamberlain, *Soviet Russia* Little). Phases of Far Eastern history were treated in W. I. Hull, *India's Political Crisis* (Johns Hopkins); A. N. Holcombe, *The Chinese Revolution* (Harvard); and C. W. Young, *The International Relations of Manchuria* (Univ. of Chicago).

THE HUMANITIES

Religion.—In the field of religion should be noted Woodbridge Riley, *The Meaning of Mysticism* (N. Y.: Smith), from Greek times down; E. R. Trattner, *Autobiography of God* (Scribner), tracing the evolution of man's conception of the deity; H. L. Willett, *The Bible through the Centuries* (Chicago: Willett), a study of its evolution and transmission; H. R. Willoughby, *Pagan Regeneration* (Univ. of Chicago), dealing with mystery initiations in Graeco-Roman times; S. J. Case, *Experience with the Supernatural in Early Christian Times* (Century); A. H. Godbey, *The Lost Tribes* (Durham: Duke), devoted to the dispersion of the Jews; A. C. Flick, *The Decline of the Mediaeval Church* (2 vols., Knopf); J. W. C. Wand, *History of the Modern Church* (Crowell); T. C. Hall, *The Religious Background of American Culture* (Little), appraising the origins of American religious traditions; and R. G. Smith, *Politics in a Protestant Church* (Washington, Ga.: Smith), an unfriendly account of Methodist activities in the Hoover-Smith campaign.

Science and Medicine.—Concerned with various aspects of science and mechanics were: H. S. Williams, *The Great Astronomers* (N. Y.: Simon), beginning with Eratosthenes; Benjamin Harrow, *The Making of Chemistry* (Day), history designed for the layman; Pauline G. Beery, *Stuff* (Appleton), another popular outline of chemistry; F. C. Bowen, *A Century of Atlantic Travel* (Little); John Goldstrom, *A Narrative History of Aviation* (Macmillan); Eric Hodgins and F. A. Magoun, *Sky High* (Little), another historical sketch of aviation; and G. G. Jackson, *The Romance of the Submarine* (Lippincott).

The Arts.—Historical accounts of the arts included Grace G. Wilm, *History of Music* (Dodd), a textbook;

P. C. Buck, *History of Music* (Cape); Mary H. Swindler, *Ancient Painting* (Yale), from paleolithic to early Christian times; E. H. Short, *The Painter in History* (Lippincott); Suzanne La Follette, *Art in America* (Harper); W. P. Eaton, *The Dream in English* (Scribner); J. M. Brown, *The Modern Theatre in Revolt* (Norton), during the last century; Mary Evans, *Costume throughout the Ages* (Lippincott), from the ancient Egyptians to the present; and Edward Warwick and H. C. Pitz, *Early American Costume* (Century) to 1820.

WORLD WAR

The controversy over war guilt brought an important contribution in Bernadotte Schmitt, *The Coming of the War, 1914* (2 vols., Scribner), inclining toward an anti-German interpretation. Other works concerned with the World War or its aftermath were: C. H. Grattan, *Why We Fought* (N. Y.: Vanguard), a pioneer inquiry into the reasons for America's participation; G. S. Viereck, *Spreading Germs of Hate* (Liveright), a inside view of wartime propaganda by a propagandist; P. A. Rockwell, *American Fighters in the Foreig Legion* (Houghton); E. L. Butts, *The Keynote of the Marne* (Menasha Wis.: Banta); P. M. Mazur, *America Looks Abroad* (Viking), and Hiram Motherwell, *The Imperial Dolla* (Brentano), two books dealing with America's new economic position in the world; F. L. Benns, *Europe Since 1914* (N. Y.: Crofts), a textbook, H. A. Gibbons, *Wider Horizons* (Century), concerned with geographic political and social changes since 1900; W. F. Ogburn and William Jaffe, *Economic Development of Post-War France* (Columbia), a survey of production; C. J. H. Hayes, *France a Nation of Patriots* (Columbia), a digest of recent patriotic propaganda in France; and J. L. Barton, *The Story of Near East Relief* (Macmillan), covering the years from 1915 to 1930.

BIOGRAPHY

By Malcolm Oakman Young

Reference Librarian, Princeton University

GENERAL AND COLLECTIVE WORKS

Vol. 5 of the *Dictionary of American Biography* (Scribner) has appeared. Donald A. Stauffer has published *English Biography Before 1700* (Harvard Press), a scholarly and important history and criticism of English biography before 1700, with excellent bibliographies. Two collections of reading from famous biographies, with critical introductions, are John C. Metcalf's *The Stream of English Biography* (Century), and R. M. Smith's *Book of Biography* (Doubleday). Volumes made up of sketches by one individual include E. Sparling, *Mystery Men of Wall Street* (Greenberg), present-day financiers; Meade Minnigerode, *Some Mariners of France* (Putnam); Archibald Henderson, *Contemporary Immortals* (Appleton), including Ford, Edison, Einstein, Gandhi, among others; Floyd D. Darrow, *Builders of Empire* (Longmans), with some of the same names; Josef W. Hall (Upton Close), *Eminent Asians*, six personalities of the New East (Appleton); R. Brenner, *Ten Modern Poets* (Harcourt); W. B. Munro, *The Makers of the Unwritten Constitution*, (Macmillan) Hamilton, Jackson, Marshall, Wilson; J. McA. Palmer, *Washington, Lincoln, Wilson* (Doubleday), Gamaliel Bradford, *Daughters of Eve* (Boston: Houghton), with miniatures of Ninon de Lenclos, Sand, Bernhardt, and others; H. S. Williams, *Great Astronomers* (Simon), an excellent history; H. C. Tracy, *American Naturists* (Dutton), including Roosevelt, Akeley, Beebe; B. Jaffe's prize-winning *Crucibles* (Simon), sketches of chemists, a book overshadowing J. N.

eonard's *Crusaders of Chemistry* Doubleday), itself a worthy book; tanley E. Morison, *Builders of the ay Colony* (Boston: Houghton), peraps the most notable in this selecive list.

THE PRESIDENTS

Washington.—Two really imporant books have been added to the Vashington Library: John Corbin, *nknown Washington* (Scribner), ith special emphasis on his political nd constitutional contributions; *Vashington, Commander-in-Chief* Boston: Houghton), by that miliary authority, Thomas G. Frothingam.

Adams.—*The Adams Family*, by ames Truslow Adams (Boston: ittle), is a valuable interpretation f four generations, while D. Bobbé's *r. and Mrs. John Quincy Adams* Minton), gives a fresh portrait of ne. In the same family group, we ention here the Henry Adams *Leters* (Boston: Houghton).

Lincoln.—The Lincoln group conains nothing outstanding: W. E. arton, *Lincoln at Gettysburg* (Inianapolis: Bobbs); W. J. Ferguson, *Saw Booth Shoot Lincoln* (Boston: oughton); F. L. Holmes, *Lincoln ravelled This Way* (Boston: Page); lbert Shaw, *Abraham Lincoln* (Reiew of Reviews), a history in conemporary cartoons of his first camaign; also the German interpreaion, Ludwig's *Lincoln* (Boston: ittle); and *New Letters and Papers*, ompiled by O. M. Angle (Boston: oughton).

Grant and Hayes.—Elizabeth Corett has *If It Takes All Summer* Stokes), on Grant in semi-fiction orm; and J. F. C. Fuller, an Englishan, has the valuable *Generalship of . S. Grant* (N. Y.: Dodd); H. J. ckenrode's *Rutherford B. Hayes* (N. .: Dodd), is not notable but a disriminating appreciation.

Roosevelt, Taft, Wilson.—Owen Vister, *Roosevelt, The Story of a riendship* (Macmillan), Lewis Eintein's *Roosevelt* (Boston: Houghon) are two new interpretations. rchie W. Butts, *Taft and Roosevelt* (Doubleday) is an illuminating collection of Butts' letters during the Taft administration. H. S. Duffy's *William Howard Taft* (Minton) is the first biography of the subject to be published since his death. While well done, it leaves space for further work. Bainbridge Colby's *The Close of Woodrow Wilson's Administration and the Final Years* (Kennerly) is an address.

OTHER POLITICAL FIGURES

The Pulitzer prize for the best biography of 1929 was announced in May as won by Marquis James' *The Raven*, a life of Sam Houston. The best biography so far written of Daniel Webster is by Claude M. Fuess, in two volumes (Boston: Little). Samuel H. Adamas' *The Godlike Daniel* (Sears) may be more popular but is, in comparison, trivial. Carl Schurz is accurately portrayed by Joseph Schafer (Evansville, Wis. Historical Soc.), and, more critically, by C. V. Easum (U. of Chicago Pr.). *Jefferson Davis, Political Soldier* (Dodd), by Elizabeth Cutting, is a valuable picture of the man. Robert W. Winston's *High Stakes and Hair Triggers* (Holt) is almost as important as an interpretation, although with faults in style and fact. J. C. Young's *Marse Robert* (Phila., Henkle) is a thoroughly readable life of Lee. Levi P. Morton is the subject of Robert M. McElroy's reliable, documented book (Putnam). Two figures active over a long period in Congress were Thomas B. Reed and Nelson W. Aldrich who are pictured in detail by W. A. Robinson (Dodd) and N. W. Stephenson (Scribner) respectively. Later figures are Debs, with a eulogistic biography by M. Coleman (Greenberg), and a more thorough one by F. R. Painter (Indiana U.); *Henry White*, by Allan Nevins, a picture of thirty years in the diplomatic service (Harper); Dwight Morrow, with two adulatory small volumes by H. H. Howland (Century) and Mary M. McBride (Farrar); and *Hizzoner Big Bill Thompson*, a breezy volume by John Bright (Cape).

INDUSTRIAL AND FINANCIAL LEADERS

Haym Salomon, the Jewish benefactor of our country in its early days, has achieved a biography by Charles E. Russell (Cosmopolitan). The elder Morgan, in a book by J. K. Winkler (Vanguard; the elder Rockefeller, critically portrayed by William H. Allen (Institute for Public Service); Hetty Green, in a biography thoroughly of the new style, bv B. Sparkes and S. T. Moore (Doubleday); Wanamaker, in a laudatory biography by J. H. Appel (Macmillan); Cyrus Hall McCormick, of the reaping machine, by W. T. Hutchins (Century), Henry Villard and the railways of the northwest, by J. B. Hedges (New Haven, Yale), are other figures in this group.

LEADERS IN MISCELLANEOUS FIELDS

Religious and Social.—The colonial character, Anne Hutchinson, has been the subject of three books, one by W. K. Rugg (Boston: Houghton), being the most painstaking; one by H. Augur (Brentano), being more dramatic, and the shortest, by Edith Curtis (Cambridge, Washburn & Thomas), being largely factual. *Roger Williams* is an objective work by Emily Easton (Boston: Houghton); *Jonathan Edwards, the Fiery Puritan* (Minton), by H. B. Parkes; *John Wesley*, by J. D. Wade (Coward); *D. L. Moody*, by his son, W. R. Moody (Macmillan); *Phillips Brooks*, by William Lawrence (Harper), form one group, while a contrasting group is *Brigham Young*, written by his daughter, Susa Young (Macmillan); *Dowie*, by Arthur Newcomb (Century); Mrs. Eddy, set forth vividly in a slightly enlarged edition of last year's authoritative and non-favorable book by E. F. Dakin (Scribner); another with the same viewpoint, by F. C. Springer (Coward), and the less reliable but favorable one by Lyman Powell (Macmillan). Honoré W. Morrow's *Tiger! Tiger!* is concerning a great temperance reformer, John B. Gough (N. Y.: Morrow). Harvey W. Wiley, the pure food and drug crusader, published his autobiography just before his death (Indianapolis, Bobbs), Jane Addam's *Second Twenty Years at Hull House* (Macmillan) will probably remain as standard a work as its predecessor. The authoritatitve life of Charles W. Eliot, by Henry James, has appeared (Boston: Houghton).

Literary.—Literary figures, artists, actors, etc. *Walt Whitman*, by H. S. Morris (Cambridge, Harvard), is a sympathetic but truthful study. The Emily Dickinson legend is speculated upon by Genevieve Taggard in a book of true penetration (Knopf) by J. Pollitt (Harper), another honest attempt, and by MacGregor Jenkins in an unpretentious book but one as satisfactory as any (Boston: Little). There are revivals of four minor 19th century figures: Gordon S. Haight's *Mrs. Sigourney* (New Haven: Yale); H. F. Barnes', *Charles Fenno Hoffmann* (Columbia); N. F. Adkins', *Fitz-Greene Halleck* (New Haven: Yale), and the specially well done *Thomas Holley Chivers, Friend of Poe*, by S. Foster Damon (Harper). Quite different in atmosphere is Margaret Anderson's, *My Thirty Years War* (Covici).

Military and Others.—Arthur Pound and R. E. Day have written a colorful picture of the romantic Johnson of the Mohawks (Macmillan). Benedict Arnold is honestly evaluated by C. C. Sellers (N. Y.: Minton). J. H. Preston has an enthusiastic, not-too-dignified biography, *Gentleman Rebel, Anthony Wayne* (Farrar). Two Confederate cavalry leaders are vividly pictured, *"Jeb" Stuart*, by J. W. Thomason (Scribner) and *General Forrest*, by E. W. Sheppard (Dial). Joseph B. and Farnham Bishop's *Life of Goethals* (Harper) is outstanding.

Men of the Frontier.—Perhaps the outstanding type of biography of the year is the increasing number of pioneer pictures, a few of which are A. P. Hannum's *A Quaker Forty-niner* (Phila.: U. of Penn.), a well-edited journal; Edna Kenton's life of her Kentucky ancestor, Simon Kenton (Doubleday), C. D. Lyman's *John Marsh, Pioneer* (Scribner), Lee Sage's *Last Rustler* (Boston: Little); Will ames' *Lone Cowboy* (Scribner. arry E. Burroughs, in *Tale of a anished Land* (Boston: Houghton), oes a vivid picture of boyhood days n Old Russia.

FOREIGN SUBJECTS

This list, much reduced to fit the imited space, may begin with L. V. ack's *Xenophon* (Scribner) and W. . Bates' scholarly *Euripedes* (Phila.: niv. of Penn.). Charles E. Rusell has written carefully of Charleagne (Boston: Houghton), the first ood picture for many years. *De Soto nd the Conquistadores*, by Theodore aynard (Longmans); Henry D. Sedgwick's, *Henry of Navarre* (Inianapolis, Bobbs); *R. V. R. Remrandt*, by Hendrik Van Loon (Liveright); *Simon Bolivar*, by Hildegarde Angell (Norton); *Thomas Killigrew, Cavalier Dramatist*, by Alfred Harbage (Phila.; Univ. of Penn.); *Brawny Wycherly*, by W. Connely (Scribner), the excellent life of Swift, by Carl Van Doran (Viking), are only a few from many. Thomas C. Chubb has a scholarly life of Boccaccio (Boni); L. P. Shanks writes of Baudelaire (Boston: Little); A. E. Burlingame of Condorcet (Boston: Stratford); Samuel Putnam of Rabelais (Cape), and A. J. Nock of the same (Harper); R. P. T. Coffin of Laud (Brentano), Hastings Lyon of Edward Coke (Boston: Houghton), Byron Steel (Francis Steegmuller) of Sir Francis Bacon (Doubleday).

TRAVEL

By Elizabeth T. Platt

Assistant Librarian, American Geographical Society

EXPLORATION LITERATURE

Antarctic.—Of special interest in he literature of travel for the year s Richard E. Byrd's *Little America* (Putnam) with L. M. Gould's chaper "The Geological Sledge Trip." *The Work of the Byrd Antarctic Expediion, 1928-1930*, by W. L. G. Joerg (Amer. Geog. Soc.), is mainly a runing account from despatches pubished in *The New York Times*. Mr. oerg has also written *Brief History f Polar Exploration Since the Introuction of Flying* (Amer. Geog. Soc.). . G. B. Cherry-Garrard's *The Worst ourney in the World; Antarctic 910-1913* (Dial) was published in ts first American edition.

Arctic.—W. H. Hobbs, *Exploring bout the North Pole of the Winds* (Putnam) is an account of three expeditions to Greenland (1926-1928) to tudy meteorological conditions. *N by E* (Brewer & Warren), written and ilustrated by Rockwell Kent, describes voyage to Greenland made by three en in a thirty-three-foot boat. In *cross Iceland* (Dodd, Mead) Olive hapman tells of her solitary trip across the island. On Alaska Charles Sheldon wrote *The Wilderness of Denali* (Scribner), a sensitive account of his game-hunting expeditions in 1906 and 1907-08, and Barrett Willoughby, *Sitka, Portal to Romance* (Houghton, Mifflin).

The Tropics.—Machu Picchu, a *Citadel of the Incas*, by Hiram Bingham (Yale Univ. Press for the Natl. Geog. Soc.), is an excellently illustrated report of explorations and excavations in Peru, 1911, 1912 and 1915. In *Man Hunting in the Jungle* (Bobbs-Merrill) G. M. Dyott writes of the Xingu region of Brazil and of his attempt to locate Colonel Fawcett. Also dealing largely with Brazil is *Dark Trails* (Putnam), by G. K. Cherrie, companion of Roosevelt to the River of Doubt.

EXPEDITIONS AND VOYAGES

Africa.—The story of Carl Akeley's fatal expedition into East Africa for the projected African Hall of the American Museum of Natural History is written by his wife and companion on the trip, *Carl Akeley's Africa* (Dodd, Mead), by Mary L. Jobe Akeley. In *Living Africa* (McGraw-Hill) Bailey Willis records his travels primarily in the rift valleys of East Africa. Delia J. Akeley's *Jungle Portraits* (Macmillan) describes animal life seen in her travels through East Africa as do Cherry Kearton's *In the Land of the Lion* (McBride) and Gretchen Cron's *The Roaring Veldt* (Putnam). To the comparatively limited material on Liberia is added Sidney De La Rue, *The Land of the Pepper Bird* (Putnam). Dr. Fred Puleston's *African Drums* (Farrar & Rinehart), a record of many years trading in Central Africa, shows conditions forty years ago. May Mott-Smith, *Africa from Port to Port* (Van Nostrand) tells of a circumnavigation of the continent.

Asia.—F. A. Larson, who has lived for years among Mongolians, writes *Larson, Duke of Mongolia* (Little, Brown). *Shambhala* (Stokes), by Nicholas Roerich, is a series of impressions of Central Asia and Tibet. Owen Lattimore's *High Tartary* (Little, Brown) is a record of his journey across Central Asia. Professor Alois Musil's travels have been issued in a popular form, *In the Arabian Desert* (Liveright). Lowell Thomas has returned to India in *India, Land of the Black Pagoda* (Century).

South Seas.—Gifford Pinchot describes his Pacific voyage in *To the South Seas* (Winston). A voyage of quite a different kind is A. J. Villiers, *By Way of Cape Horn* (Holt), and also Alain Gerbault, *In Quest of the Sun* (Doubleday-Doran), a record of a solitary voyage around the world. Hickman Powell's *The Last Paradise* (Cape and Smith) is a tale of life on the island of Bali.

Miscellaneous.—David Fairchild's *Exploring for Plants* (Macmillan) tells of wide traveling in search of plants which might be profitably introduced into the United States. Violette de Sibour, *Flying Gypsies* (Putnam) and F. K. Koenig-Warthausen, *Wings around the World* (Putnam) are both records of journeys by air. A useful bibliography of travel material is M. E. Sears, *Standard Catalog for Public Libraries: History and Travel Section* (Wilson).

AMERICAN FICTION

By May Lamberton Becker

Readers Guide, *The Saturday Review of Literature*

PUBLISHING CONDITIONS AND BOOK PRICES

In the history of American publishing 1930 is likely to go down as the year when for a prolonged and perturbing period the prices of books had a higher news value than their contents, and fiction was to be found on sale in shops where bookbuyers had not been trained to look for it. Just as hot weather set in on the eastern coast, the announcement of impending experiments in price-reduction set up an excitement that not only reached the news sections of the daily press but continued for weeks to occupy the attention of humorists in news print and on the vaudeville stage. Before that had subsided, a rush to seek new outlets for surplus stock had scattered cut-rate counters all over the country: as among the first novels to be so dispersed were the more sophisticated in tone or experimental in treatment, it was possible for September travelers across country to come continually upon pale exiles from Broadway or Greenwich Village, in faded jackets, peering through windows of small-town drug or grocery stores and wistfully awaiting ransom. It was a year in which almost anything might happen to American books, and in which almost everything uncomfortable did.

GENERAL REVIEW

Estimate.—But looking back over hese tumultuous months that have losed with the Christmas books, it s clear that our literary development as expressed in fiction has, after all, gone on a fairly even course. Many novels have come and gone, some have eft their contribution to an understanding of their time, and a distinguished few, quite as many as we generally get, are here to stay.

Outstanding Novels.—It is a good year that not only adds the admirable *Hudson River Bracketed* to the long roll of Edith Wharton's full-length novels, but gives us, in *Certain People,* a collection of short stories that rank with the masterpieces of her earlier manner. There was no general stampede in the direction of Thornton Wilder's serene *Woman of Andros* as there was toward his *Bridge of San Luis Rey;* and it thus was spared for the appreciation of the discriminating and the praise of a more constant company. Anne Douglas Sedgwick made one of her infrequent appearances, such as distinguish the season in which they occur, and in *Philippa* displayed youth, hard as unripe fruit and instinctively hardening itself against the egotisms of other lives. Jean Kenyon Mackenzie's *The Trader's Wife* put the atmosphere of the tropics and the tragedy of a soul into the compass of a slender volume. *The Great Meadow* by Elizabeth Madox Roberts, equalled her *Time of Man* in sensitiveness and passed it in sweep and scope, being indeed one of our most remarkable heroic studies of the post-Revolutionary frontier.

Most of the novelists on whom our reading public has come to depend added a work to their lists, and some of these added thereby to their reputations. Joseph Hergesheimer, in *The Party Dress,* reverted to type, not of *Java Head* but of those reactions to color and tactile sensation found in *Cytherea* and *Linda Condon.* John Dos Passos continued his experimentation toward a prose medium for the kaleidoscopic effects of an American metropolis, in *The Forty-Second Parallel.* Honoré Willsie Morrow brought her Lincoln trilogy to climax and close with *The Last Full Measure.* Dorothy Canfield, in *The Deepening Stream,* carried a woman's life from the Nineties through war and post-war collapse to spiritual conviction and the dawn of a philosophy of fulfilment. Edna Ferber told a rushing tale of rush times in Oklahoma in *Cimarron.* Booth Tarkington came back with a sentimental romance of the Maine coast, *Mirthful Haven,* and Louis Bromfield, in *Twenty-Four Hours,* grazed the edge of cinema production by making a bookful of episodes take place practically all at once.

REALISM IN CURRENT FICTION

Ruth Suckow held her place in our realism with *The Kramer Girls* and Christopher Morley in romance with *Rudolph and Amina,* a fantasy keeping green the memory of New York's most warm-hearted theatrical experiment, the Hoboken revival. A historical romance of amazing length, Manuel Komroff's *Coronet,* kept thousands panting to its close, and a discriminating audience was made to ask itself searching questions as to the idealism of the Western world, by Grace Zaring Stone's *The Bitter Tea of General Yen.* As in past years, realism was more often the method of our fiction than romance or fantasy, but the realism of the twelvemonth was stark only in spots. Mackinlay Kantor's *El Goes South* gave us Chicago by jerks, as Nathan Asch's *Pay Day* gave us New York in the spasmodic thoughts and chopped speech of wizened minds. The small town received its accustomed chastening in *Oregon Detour,* by Nard Jones, and Dawn Powell, in *Dance Night,* softened such surroundings by casting about them a veil of wistful question. Morley Callaghan added to his growing reputation by *It's Never Over,* and a comparative newcomer, Helen Grace Carlisle, conveyed in *Mother's Cry* an impression of poignant sincerity such as made more than one other story told in the first person sound forced by contrast. The conviction is growing, however, that in W. R. Burnet this school will have one of its most valuable exponents; the impression strengthened early in the year by his *Iron Man*, the grandeurs and miseries of a pugilist, was confirmed by the appearance in the autumn of *Saint Johnson*, the struggle of a Tombstone, Arizona bad man to rule the town by law and order; such a situation might have started a Wild West romance of the conventional sort but provides under his treatment a means to understanding of American idealism.

THE PROBLEM NOVEL

The problem novel concerned with social conditions has this season scattered its fire: Charles Norris's *Seed* dealt with birth control, John Tunis's *American Girl* with the exploitation of tennis champions, Cornelia James Cannon's *Heirs* with the assimilation of aliens, Julia Ellsworth Ford's *Consequence* with the opium trade, *Po' Buckra* by Gertrude Shelby and Samuel Stoney, and *Sweet Man* by Gilmore Millen with race problems, Lettice Ulpha Cooper's *The Ship of Truth* with religious faith lost and re-won, Mary Heaton Vorse's *Strike!* with labor problems, Upton Sinclair's *Mountain City* with money pressure and Edwin Seaver's *The Company* with business organization, Irving Fineman's *This Pure Young Man*, winner of the Longmans Green prize and an important first novel, arraigned contemporary civilization so skilfully and so equably that the reader scarce realized how thoroughgoing the arraignment had been.

There were fewer novels than usual about probelms of married life; Helen Hull's *The Asking Price*, Margaret Ayer Barnes's *Years of Grace*, which contrasts the social attitude of this generation with that of the one preceding; and Ludwig Lewissohn's *Stephen Escott*, with the brisk and intensely contemporary *Young Man of Manhattan* by Katherine Brush, were the chief examples; Martha Ostenso's *The Waters Under the Earth* returned to the manner and spirit of her earliest novel and displayed the tyranny of dark forces in family life. There were no problems in the deft and light-running *The Selbys*, by Anne Green, a summer entertainment whose popularity continued into cold weather, or in *Wanderer's End*, by Dennis Cleugh, a story of strolling actors, rich with good feeling, while in another first novel of importance, *Ella*, by Elizabeth Wilkins Thomas, the interest was in subtle psychological nuances.

HISTORICAL NOVELS

Besides the historical novels already noted, James Boyd's *The Long Hunt* concerned the move to the Mississippi region early in the last century; Walter D. Edmonds's *The Big Barn*, the Erie Canal country in the Sixties; Hal Evarts's *The Shaggy Legion*, the routing of the buffalo by the advance of settlement; Frances G. Wood's *Gospel Four Corners*, temperance and civic reform in Illinois in the Seventies, and Irving Bacheller's *A Candle in the Wilderness*, New England 200 years ago. Robert W. Chambers contributed his regular historical romance, *The Painted Minx* and *The Rake and the Huzzy*, for which a public waited as for Joseph Lincoln's *Blowing Weather* and Harold Bell Wright's *Exit*.

DETECTIVE STORIES

The detective story's vogue reached the point where audiences no longer discriminate and one tale pushes another out of mind: S. S. Van Dine's *Scarab Murder Case* fell behind its predecessors, and was distanced by a mystery that will be remembered, *The Door*, by Mary Roberts Rinehart.

THE SHORT STORY

The short story was unusually well represented by collected volumes: Stark Young's *Street of the Islands*, *Laments for the Living*, by Dorothy Parker; Theodore Dreiser's *A Gallery of Women*, though these are rather material for a set of novelettes; *Goods and Chattels*, by Laura Benet; *Wishbone*, by Sterling Bowen, and *Crowd Your Luck on Death*, by Harry Kapustin, stand out by reason of unusual merit of one sort or another. From a collection of short stories came the initial impulse of our most important contribution to the stage, arc Connolly's *The Green Pastures,* e nucleus of whose plot was afforded Roark Bradford's *Old Man Adam;* e appearance early in the run of e play of a second volume, *Ol' King avid an' the Philistine Boys,* af- rded a chance for comparison and ntrast.

CONCLUSION AND TABULATION

In spite of trade turmoil and busi- ess depression, much fiction has been ritten, published and even read; the regoing report will indicate the idely differing types of readers for hom it was intended. No one novel as swept the field, and no one school movement can claim that it set its ark upon the year. The following a list of the more distinctive works the year:

Hudson River Bracketed and *Cer- in People,* Edith Wharton (Apple- n); *The Woman of Andros,* Thorn- n Wilder (Boni); *Philippa,* Anne ouglas Sedgwick (Houghton); *The rader's Wife,* Jean Kenyon Macken- e (Coward); *The Great Meadow,* lizabeth Madox Roberts (Viking); *he Party Dress,* Joseph Herge- eimer (Knopf); *The 42nd Parallel,* ohn Dos Passos (Harper); *The Last ull Measure,* Honoré Willsie Mor- w (Morrow); *The Deepening tream,* Dorothy Canfield (Har- urt); *Cimarron,* Edna Ferber Doubleday); *Mirthful Haven,* Booth arkington (Doubleday); *Twenty- ur Hours,* Louis Bromfield (Stokes); *he Kramer Girls,* Ruth Suckow Knopf); *Rudolp and Amina,* Chris- pher Morley (Day); *Coronet,* Man- el Komroff (Coward); *The Bitter ea of General Yen,* Grace Zarong tone (Bobbs); *El Goes South,* Mac- inlay Kantor (Coward); *Pay Day,* athan Asch (Brewer); *Oregon De- ur,* Nard Jones (Brewer); *Dance ight,* Dawn Powell (Farrar); *It's ever Over,* Morley Callaghan (Scribner); *Mother's Cry,* Helen G. Carlisle (Harper); *Iron Man* and *Saint Johnson,* W. R. Burnet (Dial); *Seed,* Charles Norris (Doubleday); *American Girl,* John Tunis (Brewer); *Heirs,* Cornelia James Cannon (Little); *Consequences,* Julia Ellsworth Ford (Dutton); *Po' Buckra,* Gertrude Shelby and Samuel Stoney (Macmillan); *Sweet Man,* Gilmore Millen (Viking); *The Ship of Truth,* Lettice U. Cooper (Little); *Strike,* Mary Heaton Vorse (Liveright); *Mountain City,* Upton Sinclair (Boni); *This Pure Young Man,* Irving Fineman (Longmans); *The Asking Price,* Helen Hull (Coward); *Years of Grace,* Margaret Ayer Barnes (Houghton); *Stephen Escott,* Ludwig Lewissohn (Harper); *Young Man of Manhattan,* Katharine Brush (Farrar); *The Waters Under the Earth,* Martha Ostenso (Dodd); *The Selbys,* Anne Green (Dutton); *Wanderer's End,* Dennis Cleugh (Doubleday); *Ella,* Elizabeth Wilkins Thomas (Viking); *The Long Hunt,* James Boyd (Scribner); *The Big Barn,* Walter Edmonds (Little); *The Shaggy Legion,* Hal Evarts (Little); *Gospel Four Corners,* Frances G. Wood (Appleton); *A Candle in the Wilderness,* Irving Bacheller (Bobbs); *The Painted Minx* and *The Rake and the Huzzy,* Robert W. Chambers (Appleton); *Exit,* H. B. Wright (Appleton); *Blowing Weather,* Joseph Lincoln (Appleton); *The Scarab Murder Case,* S. S. Van Dine (Scribner); *The Door,* Mary Roberts Rinehart (Farrar); *Street of the Islands,* Stark Young (Scribner); *Laments for the Living.* Dorothy Parker (Viking); *Goods and Chattels,* Laura Benet (Doubleday); *Wishbone,* Sterling Bowen (Dutton); *Crowd Your Luck on Death,* Harry Kapustin (Harcourt); *Ol' King David an' the Philistine Boys,* Roark Bradford (Harper).

AMERICAN POETRY

By May Lamberton Becker

Reader's Guide, *The Saturday Review of Literature*

POETRY OUTPUT AND THE READING PUBLIC

Scanning the year's record of poetic production, the general reader might wonder at the number of volumes by which it had been enlarged during this period. For it was a year when interest in poetry did not spread beyond the devoted public to whom poetry is a necessity, as for a succession of seasons it might have been said to do, and few volumes crossed the line dividing that public from the main body of American readers. A melodramatic narrative, *The Glory of the Nightingales,* received the attention now awarded any work of Edwin Arlington Robinson; an admirable collection, *Ballads and Poems: 1915-1930,* by Stephen Vincent Benét, followed a specially illustrated re-issue of his *John Brown's Body* and brought the year to a close; while midway of the year the satiric verses of Samuel Hoffenstein in *Year In, You're Out* sustained the tradition of American humor by combining flippancy with truthtelling, to the gratification of an audience not altogether made up of poetry-lovers. In all probability the most discussed poetic compositions of the year were *The Bridge,* by Hart Crane, and *New Found Land,* by Archibald MacLeish. The former, a group of fifteen poems so treating Brooklyn Bridge as a symbol as to make a unified orchestral whole, attracted much the same attention—though fortunately not the same outburst of parody—as greeted *The Waste Land:* the latter—fourteen elegiac poems of rare dignity and power—marked the highest point so far in the development of one on whom high hopes are placed. Among the work of distinguished intellectualists must be noted *Proof,* by Yvor Winters; *Intellectual Things,* by Stanley Kunitz; and a sequence of six poems by T. S. Eliot, *Ash Wednesday,* brought out in an imposing limited edition.

NARRATIVE FICTION IN POETRY

Narrative fiction came this year, not quite to its own, at least to degree of popularity with writers ar readers that overpast that of tl lyric. Besides the book-length poe of E. A. Robinson the march of who narrative was somewhat impeded b psychological analysis—Leonard B con in *The Lost Buffalo* used *ottav rima* for incisive satire on the passin of the old Southwest—a section othe wise celebrated by nature poems i Glenn Ward Dresbach's *The Wind i the Cedars.* John V. A. Weave brought the technic of his earlier *I American* to bear on tragedies an comedies of Hollywood in *The Turning Point,* and Conrad Aiken in *Joh Deth* produced a metaphysical fantasy on the triumph of death ove life. The extraordinary versatilit of Rachel Field was once more demonstrated by her work in yet anothe medium, narrative poems of old Nev England, *Points East;* she followe this later in the season with a volum of verse for children. New Englan was the scene of *Upper Pasture,* b Charles Malam. Cale Young Rice o Kentucky included two long narratives in *Seed of the Moon,* and Constance Lindsay Skinner, in *Songs o the Coast Dwellers* reconstructed th tribal life and spirit of Indians o old British Columbia through a volume of lyrics that together give th romantic record of an ancient race.

SATIRE

Satire, which inspired several o these narratives, was not withou representation in shorter poems an in verse of an experimental nature Max Bodenheim's *Bringing Jazz* attacked the more blatant features o New York and Chicago underlife i what purports to be their own characteristic rhythms; Charles Recht' *Manhattan Made* performed a lik service for New York, and Horac Gregory's *Chelsea Rooming House* searching deeper, concerned itself no only with humanity in a city but with life in a mechanized world. Edgar Lee Masters viewed Occidental habits and ideals through the light disguise of a Chinese observer, making a sort of laundryman's Spoon River.

LYRICS

Among the volumes of lyrics were several that came from poets keeping serenely upon the even tenor of a beloved way. Lizette Woodworth Reese returned in *White April* to a public long acquainted with the beauty and poignancy of her verse: Babette Deutsch, in *Fire for the Night,* strengthened her position as a leader among her generation. The personal note was strong in *Leaves of Wild Grape,* by Helen Hoyt; *This Delicate Love,* by Winifred Welles; *This Stubborn Root,* by Hortense Flexner, and *Balm in Gilead,* by Helene Mullins; Jessie Rittenhouse, to whom the American public owes so much for her work on behalf of other poets, published another of her own infrequent and characteristic volumes, *The Secret Bird. Deep South,* by Carl Lamson Carmer, was honest regional verse with a savor of folk-spirit; *Behind Dark Spaces,* by Melville Cane, sang of the city.

BOOKS ABOUT POETRY

Criticism.—Of books about poetry the most illuminating as well as the most informing to an outsider as to present-day tendencies, was *Potable Gold,* by Babette Deutsch; another valuable posthumous volume was added to the works of Amy Lowell, *Poetry and Poets,* critical essays ranging from Whitman to six of the best-known poets of our own day.

Anthologies — The educational value of anthologies in bringing poetry in general to widening American audiences makes the appearance of an important one a matter of record. We have had this year, besides several useful collections for younger readers, the large and comprehensive *Lyra Americana,* made by Alfred Kreymborg to accompany and illustrate his history of American poetry —*Our Singing Strength*—while Louis Untermeyer's popular collections, *Modern American Poetry* and *Modern British Poetry,* have received yet another revision and enlargement, increasing their already strong influence. *Twentieth Century Poetry,* an admirably selected representative collection edited by John Drinkwater, Henry Seidel Canby and William Rose Benet, was a section of American poetry, which, like the British section, introduces each poet's work by a biographical sketch. But in general, poetry in America, after a brief incursion into the circle of general literature, has withdrawn for the time at least once more to the world of poets and critics, where discussions may rage without reaching the mass of American readers. The most distinguished subjects of such discussion have been more remarkable for intellectual content than for emotional impetus.

CRITICISM AND BELLES LETTRES

By R. N. Cunningham, Jr.

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A review of the literature of Criticism and Belles Lettres must arbitrarily set for itself certain limits. Works concerned primarily with art, biography, drama, music, philosophy, research scholarships, science, and sociology are omitted from this article, since these fields are treated elsewhere in the American Year Book. In the present selective survey the comments aim in the main to be descriptive rather than critical.

LITERARY CRITICISM

Poetry.—A variety in scope and treatment is a distinguishing characteristic of the current year's critical estimates. Amy Lowell's *Poetry and Poets* (Houghton, Mifflin) brought out by an anonymous editor, treats of poetry and presents a series of posthumous critical essays on Walt Whitman, Emily Dickinson, John Gould Fletcher, Carl Sandburg, D. H. Lawrence, John Masefield, and Edwin Arlington Robinson. In *Ten Modern Poets* (Harcourt, Brace), Rica Brenner endeavors to introduce young readers to modern American and British poets. Phosphor Mallam has written a treatise on the appreciation and mechanics of verse in *An Approach to Poetry* (Crowell).

The Novel.—Joseph Wood Krutch, *Five Masters: A Study in the Mutations of the Novel* (Jonathan Cape & Harrison Smith), considers Boccaccio, Cervantes, Richardson, Stendhal, and Proust. With probity and skill the author develops his view of why each man wrote as he did. In *Four Contemporary Novelists* (Macmillan), Wilbur L. Cross, formerly dean of the Yale Graduate School and recently elected governor of Connecticut, supplements his earlier treatment of the novel by his studies of Joseph Conrad, Arnold Bennett, John Galsworthy, and H. G. Wells.

Criticism.—Philo M. Buck, *Literary Criticism* (Harper), discusses the values in great literature and sets forth principles of critical judgment. In *New Ground of Criticism* (Univ. of Washington Book Store), V. F. Calverton contends that literature cannot be estimated apart from life. Norman Foerster has turned for a short while from humanism to edit for the World's Classics *American Critical Essays* (Oxford Univ. Press), a volume of selections from the critical writings of the nineteenth and twentieth centuries. *Some of Us* (McBride), by James Branch Cabell, sets forth in a beguiling way the novelist's critical opinions of Elinor Wylie, Frances Newman, Willa Cather, Ellen Glasgow, Joseph Hergesheimer, H. L. Mencken, Sinclair Lewis, Theodore Dreiser, Sherwood Anderson, and James Branch Cabell. The book is styled an "Essay in Epitaphs"; for, unaffected by the "new humanism," these writers have depicted life as they have seen it individually.

Aesthetics.—Isaac Goldberg's *The Fine Art of Living* (Stratford) defends the critical attitude. In dealing with the aesthetics of life the book discusses love, culture, music, painting, literature, and criticism. Helen Huss Parkhurst studies the nature of the aesthetic experience in *Beauty: An Interpretation of Art and the Imaginative Life* (Harcourt, Brace).

Miscellaneous.—In *The Greek Way* (Norton) Edith Hamilton sympathetically sets forth, chiefly by drawing from the works of the dramatic poets, the essential quality of the Greek spirit and the meaning of their ideal for us today. Two books of a quite different order, in that they combine history and criticism, are Fred L. Pattee's *The New American Literature*, 1890-1930 (Century), and Donald A. Stauffer's *English Biography before 1700* (Harvard Univ. Press), a scholarly and critical survey of "biography by Englishmen considered as a part of English literature."

BOOKS AND READING

Duffus.—In *Books, Their Place in a Democracy* (Houghton, Mifflin), R. L. Duffus, making a careful survey of publishing, bookselling, and libraries, concludes that the failure of distribution systems to reach a large number of people is fundamentally the cause of the apparent apathy of the American reading public.

Llewellyn Jones in *How to Read Books* (Norton) aims to help readers enjoy books. He writes clearly and pleasingly as he ranges over kinds of literature, aesthetics, first editions, and rare books.

William Dana Orcutt, *The Magic of the Book* (Little, Brown), continues the author's studies of books; he deals with book-making, printing, and bibliography in a familiar and reminiscent vein.

Others works in this field are Guy A. Jackson, *A Primer of Rare Books and First Editions* (Pub. by the author), and Edwin Diller Starbuck, *A Guide to Books for Character Fic-*

ion (Macmillan), a classification of ction for young people.

THE FAMILIAR AND PERSONAL ESSAY

Miles.—The periodical of the beter sort continues to be the most ferile ground for the essay, but the curent year has not experienced a earth of pleaasnt and informal obervations and opinions upon life pubished in book form. This kind of riting has flourished particularly in n academic environment. L. W. Iiles, the Collegiate Professor of nglish in Johns Hopkins Univerity, in *The Tender Realist* (Henry Iolt), comments with "gentle skeptiism and kindly humor" upon sentiientality, sophistication, loneliness, atronage, glory, fashion, war, and leep.

Chase.—Mary E. Chase's *The olden Asse* (Henry Holt, late 1929) s a collection of familiar essays rerinted from the *Atlantic Monthly,* he *North American Review,* and the *ommonweal.* In a pleasantly reainiscent manner she recalls a childood spent reading the classics in Iaine. As a professor at Smith Colege she regrets the present-day oblivon of the ancients.

Archibald H. Rutledge of the Iercersburg Academy continues in *eace in the Heart* (Doubleday, Ooran) his observations on nature nd the out-of-doors. The essays in ubstance and style reflect the conentment which the author has found n loving memories of the country f the Carolinas.

Newton.—A. E. Newton's *A Tourst in Spite of Himself* (Little, Brown) is a delightful succession of ituations, impressions, opinions, and necdotes presented in an extremely eadable style, as they were met with y the author in his travels. He uotes Doctor Johnson in calling hem "loose sallies of the mind."

Garland.—We approach autobiogaphy in Hamlin Garland's *Roadside Ieetings* (Macmillan), a series of iterary sketchs and artistic portraits, eprinted from the *Bookman.* He preents the "vicissitudes of a man of etters" and the various influences which have stirred our intellectuals.

Heydrick.—Benjamin A. Heydrick's *Familiar Essays of Today* (Scribner's) is an anthology of essays by British and American writers on a variety of themes.

AMERICAN LIFE AND THOUGHT

Humanism.—The most significant feature of American life and thought during the current year is the widespread interest in humanism. Norman Foerster edits in *Humanism and America* (Farrar & Rinehart) a symposium of essays on the outlook of modern civilization. The purpose of the book is to indicate America's needs and shortcomings as a world power and model of civilization, to consider the requirements of humanism and the tasks which confront it, to arrive at a set of adequate definitions, and to enlist the interest of intelligent people who are not indifferent to the "decay of standards and the resultant chaos into which our intellectual and moral life has been plunged." The writers pillory careless thinking and distrust undue confidence in nature; they are reserved concerning faith in God. *The Critique of Humanism* (Brewer & Warren), edited by C. H. Grattan, is a retort in thirteen essays to *Humanism and America.* The contributors suspect humanism and attack its supporters in their social, ethical, and religious attitudes, their critical standards, and their deficiencies as humanists and as men. They suggest an approach proceeding from the materials of contemporary life, not from what they regard as dogmatic definitions looking to a literary past and unknown future. In *Towards Standards* (Farrar & Rinehart) Norman Foerster studies in a clear, revealing way the development of humanistic principles in criticism. He acknowledges and explains the confusion of humanistic critics in attempted definition; outlines the claims of the personal, historical, and humanistic estimates; and emphasizes the need of standards in life, art, and criticism. A work which takes up a more limited aspect of the subject is Charles F.

Potter's *Humanism, a New Religion* (Simon & Schuster).

Miscellaneous. — Among other works reflecting the temper of America is the late Professor Vernon L. Parrington's *The Beginnings of Critical Realism in America*, 1860-1920 (complete to 1900 only), which forms the third volume of *Main Currents in American Thought* (Harcourt, Brace). The author treats the literature of the period in its relation to the emergence of a society based on material values. *Portrait of the Artist as American* (Harcourt, Brace) by Matthew Josephson, deals with the expatriated artist. The book reviews the careers and problems of some dozen artists, chiefly literary, who have forsaken the American scene. The position of the arts in democratic societies is enquired into; America is judged and found wanting; but a hope is expressed that the humanizing force of art may perhaps work through the new machines. In *The Changing Years* (Farrar & Rinehart) Norman Hapgood writes in essay style about the changes of his life. His subjects include boyhood, college, newspaper ideals, the theatr
happiness, and portraits of Brandei
Mark Twain, Roosevelt, and Wilso
Two books of tales and folklore a
Eleanor Risley's *The Road to Wil*
cat (Little, Brown), containing grac
ful and sympathetic sketches of t
people of the Appalachians from Al
bama northward; and St. Jol
O'Sullivan's and C. F. Saunder
Capistrano Nights (McBride), a co
pilation of legend and lore in t
vicinity of a California mission tow
Felix E. Schelling's *Pedagogical*
Speaking (Univ. of Penna. Press, la
1929) is a collection of ten essa
and addresses by the John Wel
Centennial Professor of English
the University of Pennsylvania.
a lively style he considers the id
of a university, the American pr
fessor and teacher of English, an
the current neglect of the humaniti
Concocted of quite different ingr
dients is a work bordering upon t
field of social psychology, *King M*
(Harcourt, Brace), by Frank
Notch. With deftness and skill t
author discloses the present-day mi
as he finds it controlled by the spi
of the mob.

ENGLISH LANGUAGE AND LITERATURE

BY ALBERT C. BAUGH

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GENERAL

References.—The present survey of American research in the field covered, like its predecessors, is selective. Many studies concerned with details too technical for the layman are omitted although they are often of considerable importance to the philologist and the literary historian. A complete list of such contributions will be found in the author's bibliography in the March issue of the *Publications of the Modern Language Association* (*PMLA*).[1] The reade
should also consult J. P. Willard

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[1] Periodicals are cited under the followi
abbreviations, the reference being always
the volume for the year covered by this r
view:—*PMLA*, *Publications of the Mode*
Language Association of America; *M*
Modern Philology; *MLN*, *Modern Langua*
Notes; *MLR*, *Modern Language Revie*
JEGP, *Journal of English and Germa*
Philology; *SP*, *Studies in Philology*; *P*
Philological Quarterly; *RES*, *Review*
English Studies; *RR*, *Romanic Revie*
Titles appearing as theses or in the public
tions of universities are followed where po
sible by the name of the university.

rogress of Medieval Studies in the nited States, Bulletin No. 8 (Boul- er, 1930), Hardin Craig's "Recent iterature of the English Renais- ance" (*SP*), and R. S. Crane's "Eng- ish Literature, 1660-1800: A Cur- ent Bibliography" (*PQ*), the last wo of which include foreign as well s American work.

LITERARY STANDARDS AND CRITICAL JUDGEMENTS

The question of literary standards nd the basis of sound critical judg- ents is one that has occupied stu- ents of literature in all ages. It is, oreover, one that demands fresh con- ideration by each age. Philo M. uck's *Literary Criticism, A Study f Values in Literature* is a sane and houghtful discussion of the many actors involved. Of more limited cope but interesting in its point of iew is Edward D. Snyder's *Hypnotic oetry: A Study of Trance-Inducing echnique in Certain Poems and Its iterary Significance.* The author istinguishes between the "spellweav- ng" and the "intellectual" types of oetry and develops an interesting arallel between the effect produced y the former and a mild state of ypnosis. Samuel S. Seward, in *The aradox of the Ludicrous*, contributes n interesting study of the sources of he humorous. Approaching the mat- er from a different point of view but oncerned in part with the same sub- ect is Willard Smith's *The Nature f Comedy.* Here the emphasis is on he drama, and the evolution of the omic is traced on the classical, the rench, and the English stages. An nnotated list of plays dealing with iblical themes, under the title "The ible in English Drama," is being ublished by Edward D. Coleman in he *Bulletin of the N. Y. Public Li- rary.* John L. Lowes has published revised edition of his *Convention nd Revolt in Poetry.* John S. Har- ison discussed *Platonism in English oetry of the Sixteenth and Seven- eenth Centuries*, and Marvin T. Her- ck *The Poetics of Aristotle in Eng- nd.* A volume of essays has been ollected from the papers of Amy owell and published under the title *Poetry and Poets.* Finally, the student interested in current notions on the subject of versification and metrics should consult George R. Stewart's *The Technique of English Verse.* Walter P. Eaton's *The Drama in English* is a popular survey of the subject. In view of the present interest in biography, Donald A. Stauffer's *English Biography Before 1700* is a timely, as well as excellent, book.

THE ENGLISH LANGUAGE

In "Linguistics as a Science" (*SP*) Leonard Bloomfield holds out high hopes for the part which the study of language will play in the future understanding of mankind. Janet R. Aiken's *English Present and Past* surveys in readable fashion the development of the English language. For the study of Old English there have been several excellent manuals noticed in this survey in recent years. The latest to appear is George T. Flom's *Introductory Old English Grammar and Reader.* George W. Small has made an exhaustive study of *The Germanic Case of Comparison, with a Special Study of English.* Rudolph Willard in "Gleanings in Old English Lexicography" (*Anglia*) records about one hundred new words, mostly from the prose homilies of the Vercelli Book. A. J. E. Zieglschmid, "Disappearance of *Werdan* in English" (*PQ*), tries to account for an interesting development in English syntax, and Harold Whitehall, in "A Note on a North-east Midland Spelling" (*PQ*) makes a small but important point in Middle English dialectology. The general reader as well as the special student will be interested in a volume entitled *Pronunciation: A Practical Guide to American Standards* by Thorleif Larsen and Francis C. Walker.

OLD ENGLISH LITERATURE
(459-1150)

Eleanor G. Clark attacks the baffling problem of "The Right Side of the Franks Casket" (*PMLA*), explaining the carving as a representation of the Judgment of Sigurd and proposing some interesting interpretations of detail. James A. Work's "Odysean Influence on the *Beowulf*" (*PQ*) records an interesting analogy between Homer and the *Beowulf*, and Margaret Schlauch notes "Another Analogue of *Beowulf*" (*MLN*). Textual interpretations of individual passages in the poem are proposed by Putnam F. Jones (*MLN*), Henry G. Lotspeich (*JEGP*), and Kemp Malone (*Anglia; MP; MLR*). Edwin J. Howard, "Cynewulf's Christ 1665-1693" (*PMLA*), defends the view that these lines are a part of the *Christ* and are by Cynewulf, and in another note comments on "*Elene*. 439" (*MLN*). Mention may also be made of Kemp Malone's discussion of "The Date of Ohthere's Voyage to Hæthum" (*MLR*).

MIDDLE ENGLISH LITERATURE
(1150-1500)

Bibliography.—As an introductory guide to study the reader will find useful W. W. Lawrence's *Selected Bibliography of Medieval Literature in England from the Beginnings to the Death of Chaucer*, while more advanced students will be interested in Seymour de Ricci's list of more than one hundred "Medieval Manuscripts in the New York Public Library" (*Bull. of the N. Y. Pub. Libr.*).

Romance.—Walter H. French and Charles B. Hale have edited a volume of *Middle English Metrical Romances* containing nineteen romances complete and seven in selection. An important contribution to the study of the Arthurian romance is made by Tom Peete Cross and William A. Nitze in *Lancelot and Guenevere: A Study on the Origins of Courtly Love.* Roger S. Loomis in "Some Names in Arthurian Romance" (*PMLA*) proposes certain criteria to be met in the identification of proper names in the romances and tests some disputed identifications by these criteria. Laura H. Loomis in "Geoffrey of Monmouth and Stonehenge" (*PMLA*) places Geoffrey's account against the background of the folklore of megalithic monuments, most of which can be illustrated from Celtic tradition. Roberta D. Cornelius has published a dissertation on *The Figurative Castle: A Study in the Mediaeval Allegory of the Edifice with Especia Reference to Religious Writings*, an has edited for the Early English Tex Society a late Middle English poem *The Castle of Pleasure*, by Willia Nevill. John M. Manly's "On th Question of the Portuguese Translations of Gower's *Confessio Amantis*" (*MP*) records the search for Robert Paym, canon of Lisbon and translato of Gower. Charlotte D'Evelyn, "A East Midland Recension of *The Prick of Conscience*" (*PMLA*), notes fiv new MSS and studies the relations o the MSS of one group. Whitne Wells in "Stephen Hawes and *Th Court of Sapience*" (*RES*) conclude that *The Court of Sapience* was th moulding force in the composition o Hawes' early poem, the *Example o Virtue*, upon which the *Pastime o Pleasure* is based.

Chaucer.—In the field of Chauce scholarship Martin B. Ruud continues his useful survey, "Chauce Studies, 1929" (*MLN*). Much wor has been done on the *Canterbur Tales.* Thomas B. Clark comment on "The Forehead of Chaucer's Prioress" (*PQ*), John W. Spargo makes a valuable contribution to the theme o *Chaucer's Shipman's Tale* (FF Communications), John S. P. Tatloc writes on "Chaucer and the *Legend Aurea*" (*MLN*) and "St. Cecilia' Garlands and Their Roman Origin" (*PMLA*), W. C. Curry discusse "Arcite's Intellect" (*JEGP*), to whic should be added C. D. Baker's "A Note on Chaucer's *Knight's Tale*" (*MLN*), W. O. Ross suggests "A Possible Significance of the Name *Thopas*" (*MLJ*). An important articl by Sanford B. Meech, "Chaucer and an Italian Translation of the *Heroides*" (*PMLA*), demonstrates Chaucer's use of an Italian translation beside his Ovid in the original, evidence that he apparently found Italian easier to read than Latin. David Patrick suggests a reverse interpretation of "The Satire in Chaucer's *Parliament of Birds*" (*PQ*) and Howard R. Patch has published an essay on "Chaucer and the Common People" (*JEGP*).

Drama.—In the early drama Osca

argill, in a volume called *Drama nd Liturgy*, attacks the accepted iew of the origin of modern drama the service of the medieval church. . Carey's *The Wakefield Group in e Towneley Cycle* is, as its sub-title eads, a study to determine the conentional and original elements in ur plays commonly ascribed to the Vakefield author. Genevieve Rogers ılls attention to an interesting "Reuction of the Speakers' Parts in the owneley *Pharao*" (*PQ*).

MODERN ENGLISH LITERATURE (SINCE 1500)

General.—Ruth Kelso has surveyed e large mass of courtesy literature f the renaissance and published her esults in a volume called *The Docrine of the English Gentleman in the ixteenth Century*, with a biblioraphical list of treatises on the geneman and related subjects published Europe to 1625. Louis B. Wright iscusses "The Renaissance Middleass Concern over Learning" (*PQ*). amuel A. Tannenbaum's *The Handriting of the Renaissance* is the reılt of many years of work on manuript materials of Shakespeare's me. M. W. Latham's *The Elizaethan Fairies: The Fairies of Folkre and the Fairies of Shakespeare* a Columbia University dissertaon. Elmer E. Stoll in *Poets and laywrights* gathers together nine esays on Shakespeare, Ben Jonson, penser, and Milton. Murray W. undy discusses "Bacon's True Opinn of Poetry" (*SP*) and Leicester radner writes of "The First English ovel: A Study of George Gasigne's *Adventures of Master F. J.*" *PMLA*). Norman E. McClure has ublished an important edition of *he Letters and Epigrams of Sir ohn Harington*, together with a itherto unnoticed essay, *The Praise Private Life*, plausibly attributed Harington. Arthur C. Sprague's *amuel Daniel: Poems and a Dence of Ryme* may be supplemented Margaret L. Farrand's "Samuel aniel and his 'Worthy Lord'" *MLN*).

Spenser.—There has been much ritten on Spenser during the year. Of more general interest are T. P. Harrison's "The Relations of Spenser and Sidney" (*PMLA*), Kenneth T. Rowe's "Sir Calidore: Essex or Sidney?" (*SP*), Ray Heffner's "Spenser's Allegory in Book I of the *Faerie Queene*" (*SP*), F. M. Padelford's "The Muse of the Faerie Queene" (*SP*), which suggests that the muse was Clio, not Calliope. A number of disputed points in Spenser criticism receive further consideration. Edwin Greenlaw in "Spenser's *Mutabilite*" (*PMLA*), and F. M. Padelford in "*The Cantos of Mutabilities* Further Considerations Bearing on the Date" (*PMLA*) concludes that the metrical characteristics point to a late date.

Shakespeare.—Space permits only a brief reference to Shakespearean scholarship. F. E. Schelling's little pamphlet *Shakespeare*, written for the American Library Association, provides a useful starting point for the general reader. Pierce Butler has assembled in a small volume *Materials for the Life of Shakespeare*. Erma M. Gill has made an extensive study of "The Plot-structure of *The Comedy of Errors* in relation to its Sources" (Univ. of Texas *Studies in English*), Baldwin Maxwell in "The Original of Sir John Falstaff—Believe It or Not" (*SP*) suggests Robert Greene as prototype, Margaret L. Farrand proposes "An Additional Source for *A Midsummer Night's Dream*" (*SP*), Robert H. Wilson examines "The Mariana Plot of *Measure for Measure*" (*PQ*), and George C. Taylor discusses "Shakespeare's Attitude Towards Love and Honor in *Troilus and Cressida*" (*PMLA*). Students of Shakespeare's later reputation will find interesting R. W. Babcock's "The Attitude Toward Shakespeare's Learning in the Late Eighteenth Century" (*PQ*).

Elizabethan Drama.—In the field of the Elizabethan drama Louis B. Wright considers "Social Aspects of Some Belated Moralities" (*Anglia*), Tucker Brooke contributes the life of Marlowe and an edition of *Dido, Queen of Carthage* to the six volume edition of Marlowe edited by R. H. Case. Henry D. Gray attempts to determine "The Roles of William Kemp" (*MLR*) and Gerald E. Beatly continues his search for actors among the London parish registers in "Players in the Parish of St. Giles in the Fields" (*RES*). Samuel A. Tannenbaum and Hyder Rollins have edited *The Drinking Academy: A Play by Thomas Randolph,* Charles A. Rouse raises the question "Was Heywood a Servant of the Earl of Southampton?" (*PMLA*), Wilbur D. Dunkel maintains the claims of Middleton for "The Authorship of *The Puritan*" (*PMLA*), and Wm. L. Sandige has prepared *A Critical Edition of Massinger's The Roman Actor* (Princeton diss.). New work on Beaumont and Fletcher includes E. H. C. Oliphant's "The Plays of Beaumont and Fletcher: Additonal Notes" (*PQ*), Albert W. Upton's "The Authorship of *The Woman Hater*" (*PQ*), and C. E. Ward's "A Note on Beaumont and Fletcher's *Coxcomb*" (*PQ*).

Seventeenth Century.—A brief working bibliography of *English Seventeenth Century Literature* has been prepared by J. W. Hebel and F. A. Patterson. George Williamson treats an important subject in *The Donne Tradition: A Study in English Poetry from Donne to the Death of Cowley.* Hyder E. Rollins continues with the third and fourth volumes of his edition of *The Pepys Ballads.* A. H. Nethercot writes of "Abraham Cowley's Essays" (*JEGP*) and "The Reputation of Native versus Foreign 'Metaphysical Poets' in England" (*MLR*). H. R. Walley and J. H. Wilson have edited a collection of *Early Seventeenth Century Plays 1600-1642,* and Alfred Harbage has written an interesting life of *Thomas Killigrew, Cavalier Dramatist 1612-83* (Univ. of Penna.). Wm. S. Clark treats "The Platonic Element in the Restoration Heroic Play" (*PMLA*), George W. Whiting discusses "Political Satire in London Stage Plays, 1620-83" (*MP*), and Kathleen M. Lynch appraises "Thomas D'Urfey's Contribution to Sentimental Comedy" (*PQ*).

Eighteenth Century. — George G. Williams studies "The Beginnings of Nature Poetry in the Eighteenth Century" (*SP*) and R. D. Havens calls attention to "More Eighteenth-Century Sonnets" (*MLN*). J. H. Caskey's "Truth and Fiction in Eighteenth-cetnury Newspapers" (*MLN*) notes two dramatic satires on journalistic practices. R. K. Root in *The Dunciad Variorum* has edited Pope's poem from the 1729 edition. Norman L. Torrey studies *Voltaire and the English Deists* (Yale) and R. W. Babcock traces "The English Reaction against Voltaire's Criticism of Shakespeare" (*SP*). Goldsmith studies include Maurice Baudin's "Une Source de *She Stoops to Conquer*" (*PMLA*), K. C. Balderston's "A Manuscript Version of *She Stoops to Conquer*" (*MLN*) now in the Huntington Library, Caroline F. Tupper's "Oliver Goldsmith and 'The Gentleman Who Signs D'" (*MLN*), and R. W. Seitz's "Goldsmith and the Present State of the British Empire" (*MLN*), the last two further tracking Goldsmith to his sources. W. Powell Jones examines "The Contemporary Reception of Gray's *Odes*" (*MP*). R. W. Babcock gathers interesting utterances illustrating "The Attack of the Late Eighteenth Century upon Alterations of Shakespeare's Plays" (*MLN*). Joyce M. Horner writes of *The English Women Novelists and Their Connection with the Feminist Movement, 1688-1797.* David Cecil offers a biography of Cowper under the title *The Stricken Deer* and Esther P. Ellinger writes on *Thomas Chatterton, The Marvellous Boy* (Univ. of Penna.). J. D. Ferguson continues his studies of Burns with three articles, "Some Notes on Burns's Reading" (*MLN*), "In Defense of R. H. Cromek" (*PQ*), and "Burns and Hugh Blair" (*MLN*).

Nineteenth Century.—Discussion of the nineteenth century must be limited to a few of the great names. Among the more important studies of Wordsworth are Herbert Hartman's "The 'Intimations' of Wordsworth's *Ode*" (*RES*), tracing the influences that contributed to the shaping of the poem, Una V. Tuckerman's "Wordsworth's Plan for His Imitation of Juvenal" (*MLN*), and Miss Marion Mead's *Four Studies in Wordsworth.* Of late years new interest has been shown in the study of Coleridge. Earl L. Griggs, author of a biography of artley Coleridge (1929) writes in- restingly of Coleridge and His Son" *P*), publishes the correspondence volved in "Coleridge and the Wedg- ood Annuity" (*RES*), and offers Toted on a Proposed Edition of the orrespondence of Samuel Taylor Col- idge" (*Papers of the Mich. Acad.*). hn D. Rea's paper on "Coleridge's ealth" (*MLN*) throws light on the dden failure of Coleridge's poetic wers. Matthias A. Shaaber traces e career of "Coleridge as a Journal- t" (*Journalism Quar.*). Roy B. lark has published a thoroughgoing udy of *William Gifford: Tory Satir- t, Critic, and Editor* (Columbia). he outstanding event of the year in ielley studies was the discovery and iblication by J. Leslie Hotson of *helley's Lost Letters to Harriet* originally published in the *Atlantic onthly*, afterwards in book form). the light of these one may read loyd Stovall's "Shelley's Doctrine of ove" (*PMLA*) and James R. Ull- an's essay *Mad Shelley*. Susanne owe in *Wilhelm Meister and his nglish Kinsmen* (Columbia) treats of apprenticeship in the art of life as a theme in English fiction. Students of Browning will be interested in Wm. C. DeVane's "*Sordello's* Story Retold" (*SP*).

CONTEMPORARY ENGLISH LITERATURE

Among treatments of contemporary writers and movements we may note Wilbur L. Cross's *Four Contemporary Novelists*, biographical and critical essays on Conrad, Bennett, Galsworthy, and Wells. S. K. Winther's *The Realistic War Novel* is a brief essay of timely interest. Odell Shepherd has written two appreciations of England's poets laureate, one of Robert Bridges, whose death occurred during the year, and the other of his successor in the honor, John Masefield (both essays in the *Bookman*). Finally, some literary contacts between England and America may be traced by the curious in Hamlin Garland's "Roadside Meetings of a Literary Nomad" (*Bookman*), especially the essay embodying his recollections of Shaw, Kipling, Zangwill, and Doyle.

GERMANIC LANGUAGES AND LITERATURE

By F. W. Kaufmann

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EUROPE

Dialect and Tribal Literature.—ne of the principal tasks of philo- gical work in Germany* is, besides ie editing of old texts, the study of ialects and the compilation of dia- ct dictionaries: the *Rheinisches, chwäbisches, Schleswig-Holstein- ches, Hessen-Nassauisches Wörter- uch* are in a more or less advanced age of publication. Similarly, the udy of tribal literature is continued: Ed. Castle, *Deutche-Österreichische Literaturgeschichte;* H. Heckel, *Geschichte der deutschen Literature in Schlesien.* The *Handbuch der Literaturwissenschaft*, edited by O. Walzel, and *Deutsche Literatur in Entwicklungsreihen*, edited by H. Kindermann which is to replace the antiquated Kürschner.

Philosophical Studies.—*National-Literatur*, also show the prevailing synthetic tendency of present-day German research. The study of the philosophical principles in literature owes its existence to the same tendency: *Philosophie der Literaturwissenschaft*, ed. E. Ermatinger (Junker & Dünnhaupt, Berlin). The newly discovered periods of Renaissance and Barock have continued to attract the interest of scholarly research: H. Gumbel, *Deutsche Sonderrenaissance in deutscher Prosa.*

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* Periodicals are abbreviated as follows: Q—German Quarterly. GR—Germanic Re- ew. JEGP—Journal of English and Ger- anic Philology. L—Language. MFDU— Ionatshefte für deutschen Unterricht. MP -Modern Philology. PMLA—Publications the Modern Language Association. SS Scandinavian Studies. SHHC—Studies in onor of Hermann Collitz. (Johns Hop- ns Press.)

Contemporary German literature has found several orientating presentations: H. Naumann added a chapter on *Die neue Sachlichkeit* to his *Deutsche Dichtung der Gegenwart;* P. Fechter, *Deutsche Dichtung der Gegenwart* and H. Kindermann, *Das literarische Antlitz der Gegenwart,* also give a tentative systematization of present tendencies in German literature. The 19th century has again been treated in a number of monographs, e.g.: H. von Kleinmayr, *Welt- und Kunstanschauung des Jungen Deutschlands;* Neis, *Romantik und Realismus in G. Kellers' Prosawerken;* but the whole of the realistic period is still waiting for a fully satisfactory presentation.

UNITED STATES

Translation. — Opportunities for taking part in the synthetic endeavor of continental scholars are relatively small for the American. The main achievements of the year are possibly not to be found in scholastic publications, but in the advancement of the acquaintance with contemporary Germanic literature through translation and editing for pedagogical purposes. Novels by L. Frank, Hauser, Ludwig, H. Mann, Schnitzler, A. Neumann, Larsen, Garborg and others have been added to the increasing stock of translations. The reading texts in the language courses are in state of rejuvenation, which will probably exert a readjusting influence on courses and research. Works of Bahr, Bonsels, G. Hauptmann, Ponten, Thiesz, Stefan Zweig, and others are, or will be available for class use in the near future.

Philological Studies.—E. Prokosch (SHHC) systematizes the Germanic vowel shift: Germanic articulation of long vowels moves farther and farther away from the resting point of the tongue, approximately i-position, whereas roughly speaking the short vowels show the contrary development. A. M. Sturtevant contributes a number of notes on Gothic syntax, and Old Norse philology and morphology (JEGP, L, SS). H. V. Velten studies the Gothic vocabulary with reference to Greek and Latin models, thereby elucidating the rendering of religious terms (JEGP). K. Malone proves that the original tradition of the story of *Ingeld* is better preserved in the English documents than in the three Scandinavian versions (MP). C. N. Gould collects and evaluates the literary evidences that cattle-worship, mainly bull-worship, was the chief animal cult known in Icelandic tradition and practice (SHHC). S. H. Cross studies the Scandinavian-Polish relations in the late tenth century (SHHC). J. L. Kellogg investigates the fate of clipped verb forms, such as *gie, fie, lie,* in the MHG period (SHHC). H. W. Nordmeyer claims that the motive of Reinmar von Hagenau's fight against Walther von der Vogelweide was not rivalry, but Reinmar's vindication of what was for him the ethical concept of *hohe Minne* (JEGP); he also attempts an emendation of the Reinmar tradition (PLMA). A higher valuation of the Alsatian Parzival as one of the few outstanding works in 14th century German literature is advocated and substantiated by E. K. Keller (GR). D. B. Shumway supplements Moser's studies on Early NHG by comparing the speech forms of the Bible of 1622 with those of 1545 (GR). M. Schlauch gives an account of the reception of mediaeval romances and chronicles into the Danish Volksbücher (GR).

The Modern Period.—W. Kurrelmeyer edited Wieland's prose of the years 1783-1794 which is published as volume 15 of *Wieland's Gesammelte Schriften* (*Preuszische Akademie der Wissenschaften, Berlin*). A. W. Porterfield shows Lessing's uniqueness among the great writers in the overworking of cardinal words, the repetition of pivotal expressions, the exploitation of favorite settings in his dramas and critical works (SHHC). J. A. Walz discusses a number of expressions in *Faust,* Part I, from the linguistic point of view. In the preface of his selection of German Dramas of the Nineteenth Century (Crofts), T. M. Campbell gives a succinct, but very elucidating study of the development of the German drama of the 19th century, Eight unpublished letters by Ludwig Tieck to Friedrich von Raumer are made accessible and commented on by Zeydel and Matenko (GR). A. P. Coleman attempts an apology of the much-vilified writer, Kotzebue, by showing that he was better informed about Russia than most men of his time, that he possessed a great affection for his country, and exerted a considerable influence on Russian literature (GR). In a study on Hebbel's *Use of Jewels*, A. W. Porterfield surveys a mannerism which seems more or less accidental, but is obviously related to the author's predilection for hard characters (PMLA). E. Feise shows in Sudermann's highest rated novel *Frau Sorge* the helplessness and the forced emptiness of the author's style, his tendency to hide the shallowness of his ideas under decorative figures (GR). E. J. Haugen studies in a group of later plays Strindberg's moral personality and the comfort his diseased mind found in the Christian gospel of love (JEGP). In an article on the early intellectual development of Gerhart Hauptmann, F. W. Heuser shows that the author has exhibited a far greater independence of thought than many of his critics have given him credit for, that he never gives himself to one established view to the exclusion of all others (GR). The role of Richard Wagner in Thomas Mann's works is examined by A. Jacobson (GR); the congeniality is seen in the pessimistic attitude, in phantastic and intellectual affinity. O. P. Schinnerer analyses those of Arthur Schnitzler's works which are not contained in the collected edition nor otherwise available in book form (GR). W. Diamond interprets Hermann Hesse's writings as one continuous attempt to find himself and the sense of his individual life (MFDU). P. Hagboldt analyses the novels of Josef Ponten and advocates their study (GQ). For exhaustive American bibliographies of Germanic Languages and Literatures see GR, and PLMA March issue.

ROMANCE LANGUAGES AND LITERATURE

By Clyde Cannon Webster

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GENERAL

Bibliographies.—Lists of works appearing in 1929 on French, Italian, and Spanish topics were published, respectively, by Lancaster, Shaw, and Crawford (PMLA).* In Italian O. A. Bontempo contributed *Italian Literature in 1929* (R. R.), C. P. Merlino *A Bibliography of Italian Homage-Volumes* (*Italica*), and M. De Philippis *Italian Books in the Library of the University of California* (*Italica*). F. W. C. Lieder's *The Don Carlos Theme* (Harv.) was a valuable critical bibliography of works on that theme.

Linguistics.—Numerous articles and notes were published in the reviews especially in the Spanish field. Several appeared in Modern Philology for May, a number devoted to the memory of Professor Karl Pietsch. Probably the most important study was H. B. Richardson's *Etymological Vocabulary to the "Libro de buen amor" of Juan Ruiz* (Yale).

FRENCH

Renaissance.—Two articles were devoted to Chrétien de Troyes: M.

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* Abbreviations: Cal., *University of California Press;* Chicago, *The University of Chicago Press;* Harv., *Harvard University Press;* Hisp., *Hispania;* IFS, *Institute of French Studies;* JHS, *Johns Hopkins Studies in Romance Literatures and Languages;* MLN, *Modern Language Notes;* MP, *Modern Philology;* Penn, *University of Pennsylvania Press;* PQ, *Philological Quarterly;* Princeton, *Princeton University Press;* PMLA, *Publication of the Modern Language Association;* RFE, *Revista de Filología Española;* RR, *Romanic Review;* Yale; *Yale University Press.*

Halpern's on the date of *Cligès* (RR) and W. A. Nitze's *Text Emendations to Chrétian's "Lancelot"* (MP). On the Renaissance the following studies appeared: *Forerunners of Feminism in French Literature of the Renaissance* (JH) by L. M. Richardson, *Influence of Ariosto's Epic and Lyric Poetry on Ronsard and his Group* (JH) by A. Cameron, *Sources of Du Bellay's "Contre les Petrarquists"* (MP) by J. G. Fucilla. J. C. Lyons published for the first time (MP) a manuscript of an essay on *Maurice Scève* by Colletet.

Seventeenth Century.—The principal publications of interest on the Seventeenth century were *Claude de l'Estoille, Poet and Dramatist* (JH) by R. and A. Parker and *Alcionée: Tragédie de Pierre du Ryer* (JH) by H. C. Lancaster. The latter also suggested some French sources of *L'Avare, Les Femmes savantes* and *Tartuffe* (MLN) and J. E. Gillet a possible Spanish source at *Tartuffe* (MLN).

Eighteenth Century.—R. L. Hawkins's *Unpublished French Letters of the Eighteenth Century* (RR), F. K. Turgeon's *Unpublished Letters of Mme. Du Boccage* (MP), and *"Polichinelle," an unpublished Parody of the "Glorieux" of Destouches* (IFS) by Van Roosbroeck and Constans were valuable contributions of *inedita*. *A Bibliography of Writings on Voltaire* (IFS) by M. H. Barr and N. L. Torrey's *Voltaire and the English Deists* (Yale) were particularly important. Other works on the period included: C. D. Brenner: *L'Histoire nationale dans la tragédie française du XVIIIe siècle* (Cal.), J. Rossi: *The Abbé Galiani in France* (IFS, and E. E. Rovillain: *L'Abbé Prevost et l'Homme sauvage de Mercier* (PMLA).

Nineteenth Century.—In *Mme de Staël and the United States* (Harv.) and *Uunpublished Letters Written in English by Brillat-Savarin and Benjamin Constant* (MLN, R. L. Hawkins brought to light some interesting *inedita*. On the Romantic period there were numerous studies, notably M. Denkinger's *La Candidature de Sainte-Beuve à l'Ecole normale en 1834* (MLN), G. Chinard's *Vigny and Ange Pitou* (MLN), and D. R. McKee's *Vigny and the Book of Job* (MLN). W. H. Royce supplemented his recent *Balzac Bibliography* with *Indexes to a Balzac Bibliography* (Chicago). On Baudelaire there were two works: M. G. Wright's *The Rôle of the Auditive Sense in Baudelaire's Works* (Penn) and an excellent biography by L. P. Shanks, *Baudelaire* (Little, Brown & Co.). *Parnassus in France* (Texas) was a study by A. Schaffer on Nineteenth century lyrical poetry. Of particular interest were J. W. Krutch's chapters on *Stendhal* and *Proust* in *Five Masters* (Cape and Smith) and G. Bradford's *Daughters of Eve* (Houghton Mifflin), containing essays on famous French women.

ITALIAN

Dante.—In the *47th and 48th Annual Reports of the Dante Society* (Cambridge, Massachusetts) papers were published entitled "Appunti per una storia del pensiero di Dante in rapporto al movimento gioachimita" by A. Donini and "The Pentateuch and the Divine Comedy" by C. H. Grandgent, whose "Islam and Dante" appeared elsewhere (*Studi Medievali*). Other studies were *Virgil and Dante* (Princeton) by K. McKenzie, *Dante Notes XII* (MLN) by H. D. Austin, *Francesca da Rimini and the "Dolce stil nuovo"* (RR) by D. Vittorini, and *New Light on the Youth of Dante* (Houghton Mifflin).

Arthurian Legend.—E. G. Gardner published an interesting book on *The Arthurian Legend in Italian Literature* (Dutton).

Boccaccio was the subject of a biography by T. C. Chubb, *The Life of Giovanni Boccaccio* (Boni) and a shorter study by J. W. Krutch in his *Five Masters* (Cape and Smith).

Modern.—In the more modern period D. Vittorini's *The Modern Italian Novel* (Penn) was a useful interpretative study. Other contributions included C. R. D. Miller: *American Notes in the Odes of Labindo* (RR) and *The Date of Nota's "La Creola di Luigiana"* (MLN), R. Altrocchi's study of *Gabriele d'Annunzio, the Poet* (Univ. Cal. Chronicle), and *The New Pirandello in "Diana e la Tuda"* (Poet Lore) by F. V. Blankner.

Miscellaneous.—D. P. Rotunda's *A tabulation of Early Italian Tales* (Cal.) will be of use to investigators, who will also welcome G. B. Weston's critical edition of Pulci's *Morgante* (Scrittori d'Italia series).

SPANISH

Medieval.—Among contributions on the medieval period were C. C. Marden's *Berceo's "Martirio de San Lorenzo" from an Unpublished Manuscript* (PMLA) and *The Personal Appearance of Juan Ruiz* (MLN), in which E. R. Kane argued that the self-portraiture of Ruiz in the *Libro de buen amor* is conventional rather than realistic.

Italian Influence.—J. G. Fucilla had three studies on Italian influence: "Las imitaciones italianas de Lomas Cantoral" (RFE), "Pedro Pedilla and the Current of the Italian Quattrocentist Preciosity in Spain" (PQ), and "Two Generations of Petrarchism and Petrarchists in Spain" (MP). J. A. Meredith published *Introito and Loa in Spanish Drama of the Sixteenth Century* (Penn).

Golden Age.—J. W. Krutch's chapter on "Cervantes" in *Five Masters* (Houghton Mifflin), S. G. Morley's *Lope de Vega's "Peregrino" Lists* (*Cal.*), a fictionalized biography of Lope by Angel Flores (Brentano), and J. G. Fucilla's *Imitations of Quevedo and Some Poems Wrongly Attributed to Him* (RR) were the most interesting studies on the Golden Age.

Nineteenth Century.—There were numerous studies by Spanish and Spanish-American writers. H. C. Berkowitz wrote on *The Memory Element in Mesonero's "Memorias"* (RR) and *Mesonero's Indebtedness to Jouy* (PMLA). On Romantic writers, there were three studies: R. Avrett's *Historical Background of Martínez de la Rosa's "La Conjuración de Venecia* (RR), E. H. Templin's *The Romantic Nostalgia of Espronceda* (Hisp), and N. B. Adams: *Los Hijos del Tío Tronera* in which Gutiérrez parodied his own *El Trovador.*

Hispano-America received attention from S. L. M. Rosenberg: *La Prosa mexicana* (Hisp), M. P. González: *Entorno a los neuvos* (Hisp), J. G. Fucilla: *A Peruvian Petrarchist: Diego d'Ávalos y Figueroa* (PQ), and Tomás Blanco: *A Porto-Rican Poet: Luis Palés Matos* (Amer. Mercury).

LATIN LITERATURE

By John C. Rolfe

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THE VERGIL BIMILLENNIUM

Pilgrimages.—The choice of the year 1930 as the two thousandth anniversary of the birth of Vergil—in spite of the mathematical fallacy involved—has had a decided effect upon the output of the year. J. Fotheringham, in *C.R.*xliv,* 1ff., argues convincingly for 1931 as the proper year, but the earlier date was adopted and given official sanction in Italy as long ago as 1924. Among the features of the celebration have been pilgrimages to the native land of Vergil and to places mentioned in his poems, in particular the tour and cruise organized and successfully carried out by the American Classical League and the Bureau of University Travel. The interest in the great Roman poet has given new life to the discussion as to the spelling of his name, which has sometimes aroused needless acrimony. The spelling of his own day was unquestionably *Vergilius;* in late Latin it became *Virgilius.* Whether one chooses to write Vergil or Virgil is purely optional. Some idea of the varying useage may be gathered from the citations in this article, which are intended to be exact in that particular.

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* Periodicals are abbreviated as follows: *A.J.P., American Journal of Philology; C.J., Classical Journal; C.P., Classical Philology; C.Q., Classical Quarterly; C.R., Classical Review; C.W., Classical Weekly; P.Q., Philological Quarterly; T.A.P.A., Transactions of the American Philological Association; U.C.P., University of California Publications in Classical Philology.* Titles of books are italicized, those of periodical articles are put in quotation marks.

Books On Vergil.—Among books on Vergil may be mentioned E. K. Rand's *In Quest of Virgil's Farm* and Mrs. Rand's translation of Bruno Nardi's *Youth of Virgil* (Harv. Univ. Press). The former is an interesting and able, though not wholly convincing defence of the claims of Pietole, the traditional site, in answer to the arguments in favor of Carpenedolo set forth by R. S. Conway in *The Vergilian Age* (Harv. Univ. Press). Series of *Vergilian Papers* have been issued by the Service Bureau for Classical Teachers (New York) and by the Department of Latin of the University of Pittsburgh. The October number of *C.J.* (xxvi) is wholly devoted to papers on Vergil. Elsewhere C. Osgood discusses "Boccaccio's Knowledge of the Life of Vergil" (*C.P.*xxv.27 ff.), H. Fairclough writes of "Virgil's Knowledge of Greek" (*Ibid.*, 37 ff.). In *C.W.* xxiii, 41 ff. T. Means takes up "The Treatment by Vergil and Ovid of the Aeneas-Dido Myth", and 76 f. T. Valentine tells of "Vergil's Treatment of Trees in the Aeneid." "The Authorship of the Crisis" is discussed by R. Steele (*A.J. P.* li, 148 ff.) and I. Dabkin writes *On the Copa* (Geneva, New York). *The Tradition of Virgil* forms the subject of three papers by J. Morgan, K. McKenzie and C. Osgood (Princeton Press). Anna Brinton published *Maphaeus Vegius' Thirteenth Book of the Aeneid* (Stanford Univ. Press).

THE TEACHING OF LATIN

In spite of the great amount of Vergilian literature, of which only a small part has been mentioned, that subject has not by any means monopolized the field. Papers on the teaching of Latin continue to occupy a good deal of space, and indicate growing dissatisfaction with some of the new methods of instruction. Typical pronouncements are the following: "Many of the efforts made to ease the shock (of learning Latin) by diluting the classical content have been misguided and inevitably ineffective. To attempt to teach Latin to morons is itself moronic" (G. Fallon, *C.W.* xxiii, 89). "The primary immediate objective of the study of Latin is the increasing ability to read and to translate Latin; and by Latin here, it seems to me, must be meant the classical Latin whch has stood the test of time" (H. Thompson, *Ibid.*, 76). The same objective is emphasized by H. Nutting in *C.J.* xxv, 531 ff. with these words: "On the attainment of this objective the attainment of the other objectives of Latin and Greek depends."

LATIN AND ENGLISH

Ortha Wilner writes of "Tennyson and Lucretius" (*C.J.* xxv, 347 ff.), H. Fairclough of "Virgil's Influence on English Verse (*C.J.* xxvi. 74 ff.). In *C.W.* xxiii, 57 ff. C. Kraemer discusses "Horace in Present-Day Quotation", and 109 ff. Mary Johnston gives an account of "John Evelyn's Vergilian Pilgrimage". In *A.J.P.* li, 135 ff. W. Houghton treats "Michael Walpole's translation of Boethius de Consolatione," and 234 ff. Gertrude Cronk writes of "Lucretius and Thomson's Autumnal Fogs." C. Knapp has "Some Remarks on 'Chairs' in English Literature" and "On Juvenal iii, 278-308" (*C.W.* xxiii, 191 f. and 199 f.)

ROMAN HISTORY

In *C.Q.* xxiii, 196 ff. W. McDonald discusses "The Tribunate of Cornelius" In *C.P.* xxv. 155 ff. K. Scott writes of "Drusus, nicknamed Castor", 173 ff. C. Van Sickle details "The Public Works of Africa in the Reign of Diocletian," and 244 ff. H. Hill discusses "Livy's Account of the Equites." In *T.A.P.A.* lx, 87 ff. Lily Taylor tells of "Tiberius' Refusals of Divine Honors", and 117 ff. K. Scott has some Roman material in "Plutarch and the Ruler Cult." In *A.J.P.* li, 62 ff. P. Townsend reports on "A Yale papyrus and a Reconsideration of the Year 328 A.D.", 70 ff. T. Frank writes of "Livy and Festus on the Tribus Papiria", and 135 ff. J. Hough discusses "The Lex Lutatia and the Lex Plautia *de vi*". In *C.W.*xxiii, 29 ff. H. Nutting considers "The Battle at Mons Graupius—Tac. Agricola 29-37." In *C.J.* xxv. 299 ff. C. Oldfather writes of "Caesars' Army in 59 B.C." The career of "Marcus Caelius Rufus" is the theme of M. Odgers in *C.W.* xxiii, 161 ff., that of *Sextus Pompeius* of M. Hadas (Columbia University Press).

LITERARY CRITICISM

M. Hadas writes of "Oriental Elements in Petronius" (A.J.P. 1—50. 387 ff.), B. Perry of "Apuleius' Metamorphoses i. 14. 17" (*C.P.* xxiv, 394 ff.), W. Rolo of "The Date and authorship of the Pervigilium Veneris" (*C.P.* xxiv, 405 ff.), L. Post of "The Art of Terence" (*C.W.* xxiii, 121 ff.), Ortha Wilner of "Contrast and Repetition as Devices in the Technique of Character Portrayal in Comedy (*C.P.* xxv, 56 ff.), and 77 ff. L. MacKay discusses "Phaselus ille iterum—Catullus IV". G. Lodge, whose retirement from active service is mentioned with an appreciation by C. Knapp in *C.W.* xxiii, 177, pleads for "Imagination in the Study of the Classics" (*C.W.*, 177 ff.) and for "The Literary Interpretation of Caesar" (*Ibid.* 185 ff. and 193 ff.) A. Wheeler writes of "Tradition in the Epithalamium" (*A.J.P.* li, 205 ff.) and R. Durrell raises the question, "Do the Epic Poets reveal themselves to us by their Failures?" (*C.J.* xxv, 500 ff.).

PATRISTIC AND LATE LATIN

The Catholic University of America adds five volumes to its Patristic Series: xxi, Sister Mary O'Brien, *Titles of Address in Christian Latin Epistolography to 534 A.D.";* xxii, Sister Mary Burns, *Saint John Chrysostom's Homilies on the Statutes;* xxiii, Sister Thérèse Sullivan, *St. Augustine De Doctrina Christiana, Book IV;* xxiv, Sister Mary Madden, *The Pagan Divinities and their Worship as Depicted in the Works of St. Augustine Exclusive of The City of God;* xxvi, G. Hoey, *The Use of the Optative in the Works of St. Gregory of Nyssa.* H. Sanders has published *Beati in Apocalipsin Libri XII* as a contribution to the Monographs of the American Academy in Rome. "The Authenticity of Letter 41 in the Julio-Basilian Correspondence" is discussed by Sister Agnes Way in *A.J.P.* li, 67 ff. The Medieval Academy of America publishes *A Concordance to the Historia Ecclesiastica of Bede,* by P. Jones.

PALAEOGRAPHY AND TEXT CRITICISM

L. Born studies "The Manuscripts of the *Integumenta* on the Metamorphoses of Ovid by John of Garland" in *T.A.P.A.* lx, 179 ff.; 48 ff. R. Robinson publishes "Some Newly Discovered Fragments of Visigothic Manuscripts". In *C.P.* xxiv, 376 ff. Mignonette Spillman offers "Notes on the Agricola of Tacitus"; xxv, 11 ff. B. Ulman discusses "The Text of Petronius in the Medieval Florilegia", and 128 ff. "The Text of Petronius in the Sixteenth Century". The Medieval Academy of America publishes *Lupus of Ferrières as a Text Critic,* by C. Beeson, and *Studies in the Script of Tours, I,* by E. K. Rand.

GRAMMAR

In *A.J.P.* 1—50, 372 ff. E. Lease presents critical "Notes on Hoffman's Lateinische Syntax and Stilistik"; 374 ff. C. U. Clark notes "An Early use of the Accentual Clausula". In *C.W.* xxiii, 120 H. Nutting writes of "The Ordinal in Accusative Expressions of Time", and in *A.J.P.* li, 233 ff. "On the Use of the Term Ellipsis". In T.A.P.A. lx.102 ff. B. Allen examines "The Sociative Ablative" Annette James discusses *The Potential Subjunctive in Independent Sentences in Livy* (Smith College Classical Studies, no. 10). H. V. Canter writes of "The Figure *ἀδ νατον* in Greek and Latin Poetry" (*A.J.P.* li, 32 ff.), H. C. Nutting of "Predicative Periods in Latin" (*A.J.P.* li, 57 ff.), of "The Latin Ablative as an Objective Case" (*U.C.P.* 10.7.193 ff.) and "On the Syntax of Nitor" (*Idem,* 10.6.169 ff.).

MISCELLANEOUS

E. T. Sage has given us a much needed edition of *Petronius, the Satiricon* (Century Co., New York and

London), and J. Mountford and J. Schultz an *Index Rerumuet Nominum to the Scholia of Servius and Aelius Donatus* (Cornell Studies, xxiii). In *A.J.P.* li, 249 ff. W. Green writes of "Appropriations for Games in Rome in 51 AD." In *C.J.* xxv, 182 ff. G. Hendrickson's "Ancient Reading" shows that the ancients usually read aloud, and that the practice continued throughout antiquity and the Middle Ages. In the same journal (204 ff.) Bernice Engle considers "The Use of Mercury's *caduceus* as a Medical Emblem", and R. Coon (277 ff.) writes of "The Vogue of Ovid since the Renaissance". In *P.Q.* viii. 369 ff. M. Hadas collects "Roman Allusions in Rabbinic Literature", and in *C.P.* xxv, 47 ff. E. Burriss discusses "The Magic Elements in Roman Prayers." In *C.W.* xxiii, 49 ff. B Kaufman has a paper on the "Horrea Romana" with a very complete citation of the sources; 105 ff. E. Burriss relates "The Objects of a Roman's Prayers"; 113 ff. Elizabeth Grier tells of "Certain Rich Men of the Second Century before Christ"; and xxv, 11 ff., 18 ff., and 25 ff. E. McCartney writes entertainingly and learnedly of "Greek and Roman Weather Lore of Winds." The useful list of "Classical Articles in Non-Classical Periodicals", by J. W. Spaeth, Jr., is continued in *C.W.* xxiii, 40 f., 87 ff., 94 ff., 128 ff. and 151 ff. and in xxiv, 7 f., and 31 ff. In *CJ.*, xxv, 367 ff. R. Meader and R. White describe "Modern Counterfeiting of Ancient Coins" and Adelaide Hawes furnishes "Light Reading from the Papyri"

GREEK LITERATURE

By Robert Chisholm Horn

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ART AND ARCHAEOLOGY

A number of excellent works in this department have been published within the last year. One of the finest and most attractive of them is Mary H. Swindler's *Ancient Painting* (Yale University Press, 1929). Another well illustrated and important work is *Classical Sculpture*, by A. W. Lawrence (Jonathan Cape, London, 1929). As the preface informs us, certain chapters are by his wife, Mrs. B. I. Lawrence. A. W. Lawrence is the author of *Later Greek Sculpture and Its Influence on East and West*, which was published in 1927 by Harcourt, Brace and Company. Still another admirably illustrated work on art is Winifred Lamb's *Greek and Roman Bronzes* (Dial Press, 1929). A contribution of great importance, part of a larger work, is by Ida Thallon Hill and Lida Shaw King, *Decorated Architectural Terracottas* (*Corinth*, Vol. IV, Part I), published by the Harvard University Press, 1929. A small but important work, with excellent illustrations, is W. R. Agard's *The Greek Tradition in Sculpture* (Johns Hopkins University Press, 1929). It is No. 7 of the J. H. U. Studies in Archaeology. Two Johns Hopkins dissertations in this general field are: H. N. Couch, *The Treasuries of the Greeks and Romans*, and Eunice B. Stebbins's *The Dolphin in the Literature and Art of Greece and Rome* (both published by George Banta Pub. Co., 1929). Brief but welcome is *Attic Black Figure, a Sketch*, by J. D. Beazley (Oxford Univ. Press, 1929). Sir J. G. Frazer's *Graecia Antiqua* (Macmillan and Co., 1930) contains maps and plans to illustrate Pausanias' *Description of Greece*, together with explanatory text by A. W. Van Buren. Last but not least is an edition for library use of *The Sculpture and Sculptors of the Ancient Greeks*, by Gisela M. A. Richter (Yale Univ. Press, 1930). This is obtainable at a lower price than the original edition; there have been some changes, and the color plates have been omitted. Announcement has just been made of the publication of the third volume of *The Palace of Minos at Knossos*, by Sir

Arthur Evans (The Macmillan Co., 1930).

TRANSLATIONS AND EDITIONS

A. S. Way has translated *The Odes of Bacchylides in English Verse* (Macmillan, London, 1929); H. Crossley, *The Golden Sayings of Epictetus with the Hymn of Cleanthes* (Macmillan, New York, 1929); and W. D. Ross and F. H. Fobes, *Theophrastus, Metaphysics* (Oxford Univ. Press, 1929). J. Lindsay's *Theocritos, Complete Poems,* contains a translation, with woodcuts by L. Ellis, and an introduction by E. Hutton (London, Fanfrolico Press, 1929). L. A. Post contributes to the appreciation of later Greek comedy in *Menander, Three Plays,* Translated and Interpreted (E. P. Dutton, 1929). A new edition of Herodotus, intended for class use, is *Selections from Herodotus,* edited with Introduction, Notes, and Vocabulary, by Amy L. Barbour (D. C. Heath and Co., 1929). An English publication is *The Apology of Socrates,* by E. H. Blakeney (London, Scholartis Press, 1929). This contains the Greek Text of Plato, edited with Introduction, Notes, Commentary, and English Translation.

GREEK LANGUAGE AND LITERATURE

Grammars.—Probably the most important contribution in this field is C. B. Gulick's revision of *Goodwin's Greek Grammar* (Ginn and Co., 1930). Parts have been entirely rewritten; the aim is to make use of our recently increased knowledge of the Greek language. This will be most welcome to all teachers and students of the classics. In the realm of New Testament Greek we welcome Part VIII of Moulton and Milligan's *Vocabulary of the Greek New Testament* (Hodder and Stoughton, 1929), which now completes this scholarly work; and Volume II, Part 3 of the *Grammar of New Testament Greek,* by J. H. Moulton and W. F. Howard (Scribner's, 1929).

Euripides.—A book full of interest is *Euripides: A Study of Human Nature,* by William N. Bates (Univ. of Penna. Press, 1930). Professor Bates has been a lifelong student of Euripides; and out of the fullness of his acquaintance with the dramatist he has given us an appreciative and sympathetic account of Euripides and his plays.

Antigone of Sophocles.—As an evidence of the influence of Greek in college is *The Antigone of Sophocles,* by Maurice Neufeld (Madison, Wis., 1930). This is a metrical translation of the play by a college student, with a foreword by Alexander Meiklejohn. This translation was used for the presentation of the play by the Experimental College Players of the University of Wisconsin.

Homer and Others.—*The Book of Diogenes Laertius: Its Spirit and Its Method,* by Richard Hope, is a new treatment of this author and his work (Columbia Univ. Press, 1930). Homer still has an irresistible appeal; an important book by a competent scholar is *The Composition of Homer's Odyssey,* by W. J. Woodhouse (Oxford Univ. Press, 1930). Although very brief, still very welcome is *Andrew Lang's Work for Homer,* by A. Shewan (Oxford Univ. Pres, 1929). *The Poetics of Aristotle in England,* by M. T. Herrick, is published by the Yale University Press, (1930).

GREEK LIFE

Ancient Greece.—*Engineering,* by A. P. Gest, and *Hellenistic Civilization,* by W. W. Tarn, second edition, are the new publications in the series entitled *Our Debt to Greece and Rome* (Longmans, Green and Co., 1930). *Greek Medicine,* by A. J. Brock (E. P. Dutton, 1929) is a book of extracts illustrative of medical writers from Hippocrates to Galen. The Macmillan Company has just announced publication of *Orpheus: Myths of the World,* by Padraic Colum and illustrated by Boris Artzybasheff. The Greek and Roman myths are only a small part of the whole. *The Way of the Greeks,* by F. R. Earp (Oxford Univ. Press, 1929), is a series of essays interpreting the Greek spirit. A book with a similar title is *The Greek Way,* by Edith Hamilton (W. W. Norton and Co., 1930). The purpose of this book is to interpret the spirit and genius of the Greeks particularly the spirit of their literature. *Little Plays from the Greek Myths,* by Audrey Haggard (E. P. Dutton, 1929) contains four little plays for children, written in verse, with suggestions for scenery and costumes as well as stage directions. *Private Letters, Pagan and Christian,* by Dorothy Brooke (E. P. Dutton, 1930) is a collection of letters in translation which will throw an interesting light on Greek life for those who cannot use the Greek language. A. S. Way's *Sons of the Violet-Crowned: A Tale of Ancient Athens* (Macmillan, New York, 1929) will be found most interesting.

Modern Greece.—There are several good books on Greece as it is today. Among these is *Hellas Revisited,* by W. M. Dixon (Longmans, Green and Co.). *Greece Today,* by E. G. Mears (Stanford Univ. Press, 1929) bears the explanatory subtitle: *The Aftermath of the Refugee Impact.* Its point of view is largely economic and expresses the hopefulness of the writer for the future of Greece. The book is published in the series entitled *Stanford Books in World Politics.* George Horton's *Home of Nymphs and Vampires* (Bobbs-Merrill Co., 1929) is an interesting book on the Isles of Greece, their charm and folklore, with many reminiscences of classical literature. The author, who is already well known, has given us another delightful book.

GREEK HISTORY

A Survey of Ancient History, by M. L. W. Laistner (D. C. Heath and Co., 1929), although necessarily condensed, is accurate and interestingly written. Another recent work in this field is *Ancient History,* by C. J. H. Hayes and P. T. Moon (Macmillan, 1929). *Who Were the Greeks?* by John Linton Myres is Volume VI of the *Sather Classical Lectures* (Univ. of California Press, 1930). W. L. Westermann's *Upon Slavery in Ptolemaic Egypt* (Columbia Univ. Press, 1929) is a brief discussion of this subject, with interpretation of a papyrus fragment in the collection of Columbia University, which is now published for the first time. Readers will find much of interest in Sir Aurel Stein's *On Alexander's Track to the Indus* (London, Macmillan, 1929). Two other books of great importance are: *Thucydides and the Science of History,* by C. N. Cochrane (Oxford Univ. Press, New York, 1929), and *The Administration of Justice from Homer to Aristotle,* by Robert J. Bonner and Gertrude E. Smith (Univ. of Chicago Press, 1930). For Greek affairs of a later age attention is called to Robert Byron's *The Byzantine Achievement: An Historical Perspective A. D. 330 to 1453* (Knopf, New York, 1929).

GREEK PHILOSOPHY

Frederick J. Woodbridge's *The Son of Apollo* (Houghton, Mifflin Co., 1929) is an attractively written book on an appealing subject, Themes of Plato. *The Searching Mind of Greece,* by J. M. Warbeke (F. S. Crofts and Co., 1930), was written, as the author indicates, primarily for students of philosophy in colleges and universities; but the general reader also, as the author hopes, will derive benefit.

GENERAL

Loeb Classical Library.—The Volumes in this series published in the last year are: *Plato,* Vol. VII, by F. M. Cornford and R. G. Bury; *Aristotle, Physics,* Vol. I, by P. H. Wicksteed and F. M. Cornford; and *Arrian, History of Alexander and Indica,* by E. I. Robson. The American publishers are G. P. Putnam's Sons.

Gildersleeve.—Probably the most interesting book of the year to the lovers of the Classics is *Selections from the Brief Mention of Basil Lanneau Gildersleeve,* edited with a biographical sketch and an index by C. W. E. Miller (Johns Hopkins Univ. Press, 1930). It is hardly necessary here to do more than express appreciation of the wealth of material chosen from Professor Gildersleeve's "Brief Mention". Former students, friends, and admirers, and indeed all Classical scholars, will be more than pleased.

SEMITIC LANGUAGE AND LITERATURE

By George A. Barton

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Moore's Judaism.—Undoubtedly the most important book published in the field of Semitic Literature during the year is Vol. 3 of George F. Moore's *Judaism*. This volume embodies the notes and "Beilage" upon which the conclusions expressed in Vols. 1 and 2 are based. As Professor Moore is a past master in this field, this volume has been awaited with great expectation.

Egyptology.—Of real importance to scholarship are the two volumes in the field of Egyptology published by the Oriental Institute of the University of Chicago, under the editorship of Professor James H. Breasted. The first is *Medinet Habu*, Vol. 1, Earlier Historical Records of Ramses III. The book is an oversize folio containing 54 plates and 10 double columns of introduction. Of the plates, 34 reproduce photographs of Medinet Habu and its inscribed walls, and 20 plates are of Egyptian hieroglyphic texts. The texts have been copied and studied with the most painstaking care by a competent staff of Egyptologists and the result is doubtless as near an approach to absolute accuracy as is obtainable. The volume is not only an important scientific contribution but a distinct credit to American scholarship. The other work is the *Edwin Smith Surgical Papyrus*, published in Facsimile and Hieroglyphic Transliteration with Translation and Commentary, in 2 vols. Volume 1 contains the translation and Commentary, in quarto, consisting of 596 pp. and 8 plates. Volume 2 contains the text of the papyrus and the transliteration into hieroglyphics and contains 42 plates; folio. The plates are preceded by 14 pages of introduction. The work is most carefully done and the printing and paper are both worthy of the scientific character of the book.

Usãmah.—Perhaps next in uniqueness to these works is the publication of Professor Philip K. Hitti of *Usãmah's Memoirs*, entitled *Kitab Al-I-'Tibar*. This work is issued by the Princeton University Press, 1930. Usãmah (1095-1188) was a warrior, a hunter, a gentleman and a poet. He sojourned in the courts of the Fatimite caliph in Cairo, of Saladin in Damascus and of Zanki in Mosul, and had personal contacts with Baldwin, Bohemond, Roger and other leaders of the first two crusades. When not engaged in repelling Frankish, Byzantine, or Assassin attacks on his picturesque castle, Shayzar, on the Orontes, he was hunting lions, hawking, or writing poetry. His life was an epitome of Arab civilization as it flourished during the early Crusading period on Syrian soil. His patron and friend was the great Saladin.

Ancient Babylonia.—Of quite diferent character, but greater historical importance, is *Mesopotamian Origins* by Professor Ephraim A. Speiser, published by the University of Pennsylvania Press, in September, 1930. The thesis of this book is that three races contributed to the civilization of ancient Babylonia, instead of two, and in working out the thesis, Professor Speiser has not only, at important points, corrected the mistakes of his predecessors but has thrown a new and welcome light upon the historical problems of ancient Babylonia. Professor Speiser reveals in the volume an unusual breadth of scholarship. Every page of his book exhibits also a penetrating insight. It is a remarkable work for so young a scholar and is, we trust, an earnest of much more to be expected from his pen.

Oriental Research.—During the year the second volume of the *Publications of the American Schools of Oriental Research* at Baghdad has appeared. The book is the work of Professor Edward Chiera and contains 121 texts from tablets discovered by him at Nuzi in 1925, when excavating for the Government of Iraq and the Baghdad School. These texts consist of "declarations in court," and place at the disposal of scholars another group of documents which throw light upon the civilization of ancient Arraepkha.

Volume 10 of the *Annual* of the American Schools of Oriental Research which appeared in September, 1930, contains also an important study by Professor Speiser of new documents from Nuzi relating to family laws. It thus interprets in English some of the material to which Professor Chiera's volume is a contribution. The same *Annual* continues Professor Barton's "Sign List of the So-called Sumerian Seals," thus completing the study which he began in Vol. 8 of the same publication.

Petra.—Another important work, published in 1930, by an American scholar, is Professor George L. Robinson's *Sarcophagus of an Ancient Civilization*, Petra, Edom, and the Edomites, published by the Macmillan Company, New York. Professor Robinson has been a student of the archaeology and history of ancient Petra for thirty years, during which he has made several tours of exploration through that country and he presents in this book the results of his researches. The work is illustrated by the reproduction of numerous photographs and will take its place beside Dalman's *Petra* as one of the important sources of information for that fascinating region.

Hebrew History.—In September, 1930, the Century Company, New York, published *A History of the Hebrew People*, from the Earliest Times to the Year 70 A. D., by Professor George A. Barton, written on a new plan. The book is an attempt to permit the Biblical writers to tell, so far as possible, the history of the Hebrews in their own language. Wherever possible, therefore, the historical facts are given by extensive quotations from the Biblical text. In what might be called Biblical conceptions of pre-history, selections are quoted from the Biblical traditions with appropriate critical notations. Between the excerpts from the Bible throughout the book such explanatory comments are introduced as are necessary to show the connection and make the history clear. The portions of the history not covered by the Bible, such as the period between Nehemiah and the Maccabees, and between the Maccabees and the Fall of Jerusalem in the year 70 are supplied by the author in his own language.

INDO-EUROPEAN LINGUISTICS

BY J. ALEXANDER KERNS

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GENERAL

Phonology.—A very considerable modification of the current theory of ablant is proposed in L. H. Gray's article, "Vocalic Alternation in the Dissyllabic Base in Indo-European" (*Am. Jour. Phil.* LI, 273-285).

Morphology.—In connection with his work on ablant Gray has also analyzed morphological phenomena in two important articles, "The Personal Endings of the Present and Imperfect Active and Middle" (*Lang.*, VI, 229-252) and "Sur l'inflexion des prétendus thèmes en—I" (*Bull. de la Société de Linguistique de Paris*). Other far-reaching problems of morphology are dealt with in two articles by W. Petersen, "The Inflection of Indo-European Personal Pronouns" (*Lang.*, VI, 164-193) and "Hittite and Indo-European Nominal Plural Declension" (*Am. Jour. Phil.* LI, 251-272).

Syntax.—E. H. Sturtevant, "Neuter Pronouns Referring to Words of Different Gender or Number" (*Studies in Honor of Hermann Collitz*, 16-24).

A. J. F. Ziegelschmid, "Concerning the Disappearance of the Simple Past in Various Indo-European Languages" (*Mod. Phil* IX, 153-157). Edward Sapir, *Totality* (28 pp.). (Language Monograph Series, Ling. Soc. America.)

SANSKRIT, GREEK, ITALIC

Franklin Edgerton, "Dialectic Phonetics in the Veda: Evidence from the Vedic Variants" (*Studies in Honor of Hermann Collitz*, 25-36) Truman Michelson, "Linguistic Miscellany" (*ibid*, 37-40). G. F. Bolling, "A Matter of Semantics" (9K omepdvos, etc.) (*ibid*, 43-47). To the same volume the distinguished German scholar, Edward Sievers, contributed a study of the archaic Latin Duenos-Inscription (pp. 48-62).

VULGAR LATIN AND ROMANCE

E. Cross, "Syncope and Kindred Phenomena in Latin Inscriptions" (Diss. in "Publications of the Institute of French Studies," New York). H. G. Bayer, "French Names in Our Geography" (being a selection from a forthcoming book on the same topic) (*Romanic Review*, XXI, 195-203). E. B. Place, "Causes of the Failure of Old Spanish *Y* and *En* to Survive" (*ibid*, 223-228). E. B. Williams, "The Second Person Plural in Portuguese" (*ibid*, 142-145). H. D. Learned, "The Phonetic Value of Old French *ue* from Vulgar Latin Open *o*" (Pub. Mod. Lang. Assn. XLV, 392-399).

GERMANIC

The volume of *Studies in Honor of Hermann Collitz* contains many studies by both American and foreign scholars. Note especially E. Prokosch, "The Germanic Vowel Shift and the Origin of Mutation" (70-82); L. Bloomfield "Salic *Litus*" (83-94); E. H. Sehrt, "Der Genitiv Plural auf, ē in Gotischen"; A. M. Sturtevant, "Gothic Syntactical Notes" (101-113); E. E. Ericson, "The Use of Old English *swa* in Negative Clauses" (159-175); S. Kroesch, "Change of Meaning by Analogy (176-189); J. L. Kellogg, "The Phonetic and Morphological Settings of the Middle High German Clipt Preterits" (212-243); D. B. Shumway, "Old Preterits of the First Ablant Class in the 1671 Wittenberg Revision of the Lutheran Bible" (244-247). Apart from the contents of this volume one may note A. M. Sturtevant's articles, "Die altnordische Senkung *ĭ*: *Ŭ*: *ĕ*: *ŏ* vor *KK*, *pp*, and *tt* (aus **Nk*, **mp*, **Nt*)" (*Am. Jour. Phil* LI, 42-50); "Some Critical Notes on Old Norse Phonology" (*Lang.*, VI, 253-263), and "Old Norse Phonological Notes" (*Jour. Eng. Germ. Phil.* XXIX, 237-242), as also those of A. J. F. Zieglschmid, "The Disappearance of *Werdan* in English" (*Mod. Phil.* IX, 111-115) and "The Historical Development of the Past Subjunctive in German" (*Jour. Eng. Germ.* Phil. XXIX, 372-375) and the following individual titles: L. Bloomfield, "Old English Plural Subjunctives in *-e*" (Jour. *Eng. Germ.* Phil. XXIX, 100-113); R. M. S. Heffner: "Goth *rs:r* Final" (*ibid*, 319-332); W. F. Twaddle, " 'Werden' and 'Wesen' with the Passive in Notker" (*Germ. Review* V, 288-294); D. B. Shumway, "The Language of the Luther Bible of 1671" (*ibid*, 247-287 and 345-377); H. V. Velton, "Studies in the Gothic Vocabulary with Especial Reference Inflection of Indo-European Personal Pronouns" (*Lang.*, VI, 164-193) and "Hittite and Indo-European Nominal Plural Declension" (*Am. Jour. Phil.* LI, 251-272); A. J. F. Ziegelschmid, "Concerning the Disappearance of the Simple Past in Various Indo-European Languages" (*Mod. Phil.* IX, 153-157).

HITTITE

E. H. Sturtevant, "The Original Diphthongs in Hittite" (*Lang.*, VI, 25-35); id, "Can Hittite *h* Be Derived from Indo-Hittite *ϭ?*" (*Lang.*, VI, 149-158); id, "The Gutturale in Hittite and Indo-European" (*Lang.*, VI, 213-228); C. H. Carruthers, "Some Hittite Etymologies" (*Lang.*, VI, 159-163) to "Greek and Latin Models and Analogues" (*Jour. Eng. Germ. Phil.* XXIX, 332-351); E. H. Sehrt, "The O. H. G. Imperative Forms Lâz, Lâ (*Mod. Lang. Notes*, XLV, 230-232) and G. W. Small, "The Syntax of (Eng.) *The* and O. E. *pon mā pe*" (Pub. Mod. Lang. Assn., XLV, 368-

391), which last supplements the same scholar's monograph "The Germanic Case of Comparison," published in the *Language Monographs* of the L. S. A. in 1929. E. H. Sturtevant, "Indo-European *bh* corresponds to Hittite *p* (*Journal. Am. Orient. Soc.*, 50, 125-128).

INDO-IRANIAN

A. Abbott, "The 300th Anniversary of the Birth of the Maratha King Shivaji (*Jour. Am. Orient. Soc.*, 50, 159-152); A. K. Coomaraswamy, (1) "Pali *Kaṇṇika*—Circular Roof-Plate," (2) "The Parts of a *Vīnā*", (*ibid*, pp. 238-253); L. C. Barrett, "The Kashmirian Atharva Veda," Book XV, edited with Critical Notes (*ibid*, pp. 43-73); E. W. Hopkins, "Allusions to the Rāma-Story in the Mahābhārata" (*ibid*, pp. 85-103); A. V. W. Jackson, (1) "On a Passage in Bāna's Harṣacrita," (2) "Sketch of the Manichaean Doctrine Concerning the Future Life" (*ibid*, pp. 129-131, 177-198); R. A. Schermerhorn, "When Did Indian Materialism Get Its Distinctive Titles?" (*ibid*, pp. 132-138).

LIBRARIES

BY JUNE STAFFORD SCHEIBLE

PUBLICITY DEPARTMENT, AMERICAN LIBRARY ASSOCIATION

SERVICE AND CIRCULATION

The modern library movement in the United States and Canada aims not only to bring adequate book service within easy reach of everyone, but to align itself with many significant educational and social developments. These include projects in the fields of adult education and educational work with children, work with the handicapped and the foreign born, and promotion of international coöperation. More than 6,422 libraries in the United States now report collections of 3,000 or more volumes, while 97 have 200,000 volumes or more. Total circulation figures for all libraries in the United States are not available, but reports of libraries in 38 leading cities show a circulation of more than 121 million books during the past year, an increase of more than 4 million over the preceding year. Public libraries with the largest circulation in 1929-30 were: Chicago, 14,534,393; New York (excluding Brooklyn and Queens), 11,103,019; Los Angeles, 9,682,305. Those with the largest per capita circulation were: Portland, 9.7; Cleveland, 9.57; Los Angeles, 7.86.

LIBRARY EXTENSION

New County Libraries.—Progress in reaching the 50 million people without adequate book facilities can be reported, with the establishment of fifteen new county libraries between October, 1929, and October, 1930, making a total of 223 in the United States. Nine of these are in southern states and four received grants from the Julius Rosenwald Fund. In Canada, comparable units of service are proving desirable. An experiment in providing people in a large, sparsely settled section of British Columbia with library service was financed early in 1930 by a $100,000 grant from the Carnegie Corporation, following a survey recently completed by the British Columbia Public Library Commission.

State library field work has been made possible in Alabama, Tennessee, South Carolina and Arkansas through Rosenwald grants. Southern library development received added impetus with the appointment of an American Library Association regional field agent for the South, Miss Tommie Dora Barker, under the A. L. A. Committee on Library Extension. North Carolina was the third southern state to appoint a supervisor of school libraries, Virginia and Louisiana having made appointments previously.

Institutes and Conferences.—The first Rural Library Extension Institute for experienced workers was conducted during the summer of 1930 at the University of Wisconsin in connection with the Ninth Rural Leadership Summer School. Rural sociology and adult education, as well as extension problems, were discussed. In Kentucky, a state conference on libraries, called at the suggestion of the president of the University of Kentucky, was held at Lexington in October, with the object of assisting in the preparation of a program for library development in that state. A summer institute for negro librarians, financed by the Julius Rosenwald Fund, was held at Spelman College, Atlanta, Ga., with Charlotte Templeton, president of the Southeastern Library Association, as director.

Legislation.—Legislation for state aid for county libraries was introduced in the legislatures of Louisiana, New York and Virginia. Although it failed in each state, keen interest in the measure indicated that New Jersey's example in providing state aid would probably be followed next year. In Mississippi, the county library law was revised to make possible more generous appropriations for this service. The close of the Louisiana Demonstration, conducted by the Louisiana Library Commission, brought to a successful conclusion a five-year experiment in arousing widespread interest among the people of a state in the development of free book service. The state legislature has appropriated funds to carry on the work of the Commission for another year. In New Brunswick, a Provincial Library Commission has been established and funds have been secured for organization purposes. A quick survey of the library situation in Canada has been made and a published report of the results has been announced for release early in 1931.

ADULT EDUCATION SERVICE

Radio and Alumni Education.—Four experiments with reading lists in connection with nation-wide broadcasting were carried on by: (1) the World Peace Foundation and the Foreign Policy Association; (2) the Walter Damrosch music appreciation broadcasts; (3) the American Library Association in connection with the League of Women Voters' programs; and (4) the American School of the air. The response of the radio public has been such that all four services are being continued during 1931.

Demonstrations in alumni education are being carried on through grants from the Carnegie Corporation in Lawrence College at Appleton, Wis., Lafayette College at Easton, Pa., the University of Michigan, Vassar College, and Ohio State University. Recommended book lists are compiled, in some cases books are supplied and in others discussion groups formed.

"Reading With a Purpose."—These courses, published by the American Library Association as guides to systematic and consecutive reading have been issued in more than sixty subjects. Each course is written by an authority and consists of a short essay followed by a recommended list of five or six books. Courses published in 1930 were: *English History* by George H. Locke, *Invention and Society* by Waldemar Kaempffert, *Scandinavian Literature* by Hanna A. Larsen, *Shakespeare* by Felix E. Schelling, *International Relations* by Isaiah Bowman, *Short Story Writing* by Blanche Colton Williams, and *Representative Twentieth Century Americans* by M. A. DeWolfe Howe. Successful discussion groups have been established at the Long Beach, Calif., Public Library, in which members follow a definite course of reading and, under competent leadership, discuss the books they have read. Similar projects have been worked out by the public libraries of New York, Portland and other large cities.

Prison Libraries.—An important step in the development of prison library facilities was the appointment of John Chancellor as supervising librarian, Office of the Superintendent of Prisons, Department of Justice, Washington, D. C.

LIBRARY SCHOOLS

Courses and Enrollment.—Recent progress in education for librarianship has been marked by a rapid increase in the number of courses offered both in the academic year and summer sessions and by the larger enrollment in library schools. The Board of Education for Librarianship of the American Library Association has accredited eighteen library schools and provisionally accredited five other schools. Nine accredited library schools require college graduation for entrance, nine require three college years, and the others two college years. Five offer professional study leading to a master's degree. In 1929-30 the eighteen accredited library schools enrolled 1,076 students. Approximately eighty institutions offered summer courses in library science in 1930, specializing chiefly in school library work to meet the general demand for school and teacher librarians.

Southern Survey.—Early in 1930, a survey of library training agencies in thirteen southern states was conducted by Sarah C. N. Bogle, secretary of the A.L.A. Board of Education for Librarianship, and Tommie Dora Barker, regional field agent for the South for the American Library Association, under a special grant from the Carnegie Corporation.

Training for School Librarians.—Three accredited library schools specialize in the training of school librarians, while special training for school librarians is offered by several other accredited library schools. A survey of agencies for training school librarians in California was made by the assistant secretary of the American Library Association at the request of the state superintendent of instruction.

Certification Standards.—Certification of school librarians has received special attention in several states, notably New York, Indiana and California. In New York, the Board of Regents approved a certification plan by which every librarian of professional grade in the state is required to hold a certificate based on the Standards of Service. Certification standards for school librarians were revised at the annual meeting of the Association of Colleges and Secondary Schools of the Southern States in Kentucky and the time limit for their final enforcement was extended to the autumn of 1933.

New Fellowship.—A new award, the E. P. Dutton Fellowship for study in the field of library work with children, was given by John Macrae, Jr., during the past year.

AMERICAN LIBRARY ASSOCIATION

Election of Officers.—More than 2,000 librarians attended the fifty-second annual conference of the American Library Association held at Los Angeles during the week of June 23, the third largest conference in the history of the Association. Officers elected for the year 1930-31 were: Adam Strohm, librarian, Public Library, Detroit, president; Louis R. Wilson, librarian, University of North Carolina Library, first vice-president; Charlotte Templeton, librarian, Public Library, Greenville, S. C., second vice-president; Matthew S. Dudgeon, librarian, Public Library, Milwaukee, treasurer.

Newbery Medal Award and Conference Meetings.—The John Newbery Medal, awarded each year by the A.L.A. Section for Library Work with Children, for the most distinguished children's book of the year, was given to Rachel Field for her book, *Hitty, Her First Hundred Years.* In addition to more than thirty regular round tables of the Association two new groups, the junior college library and the young people's reading round tables met for discussion. At the junior college library round table, a "measuring stick" of standards for junior college libraries was adopted. The A.L.A. Council voted formal approval of the Pratt Bill, authorizing an appropriation of $100,000 annually to be used to expand the work of the department for the blind in the Library of Congress, endorsement of the principle of generous state aid for county and other large unit rural library service, designation of Mrs. Elizabeth Sprague Coolidge as an honorary member of the Association, in recognition of her devotion to the cause of fine music. Affiliated national societies meeting with the Association at the annual conference were: the American Association of Law Libraries, the League of Library Commissions, and the National Association of State Libraries.

Arizona Session.—Preceding the Los Angeles program the first Arizona meeting of the Association was held at the Grand Canyon June 21 as a preliminary session to the annual conference.

Book Censorship.—During the year, book censorship was vigorously opposed by the A.L.A. Committee on Federal and State Relations. The Committee approved section 305 of the Tariff Bill, as amended by Senator Cutting, as the best compromise possible.

White House Conference.—The White House Conference on Child Health and Protection, organized by President Hoover, appointed a committee on reading with Carl H. Milam, secretary of the American Library Association, chairman. A report of the *Voluntary Reading of Boys and Girls in the United States*, submitted for publication, dealt briefly with the place of reading in the life of the child, sources of reading matter, and steps recommended to parents, agencies or governmental departments to foster good reading.

Publications.—Important publications issued by the American Library Association during the past year were: *Reference Work* by James I. Wyer, *Introduction to Cataloging and the Classification of Books* by Margaret Mann, *The Library in the School* by Lucile F. Fargo, *Book Selection* and *Order Work for Libraries* by F. K. W. Drury, *American Library Laws* by Milton J. Ferguson, and *Library Service for Children* by Effie L. Power. Another new publication, which was enthusiastically received by libraries and schools, was the *Subscription Books Bulletin*, a quarterly presenting critical estimates of subscription books and sets sold currently by canvassing agents.

INTERNATIONAL DEVELOPMENTS

New Statutes of Federation.—The new statutes of the International Federation of Library Associations were formally approved by the American Library Association Council at its mid-winter meeting. The A.L.A. is a member of the Federation.

Foreign Meetings.—Among foreign meetings of importance attended by American library representatives were the International Library Committee conference in Stockholm in August, the Second Pan-Pacific Women's Conference in Honolulu, and the meeting of the World Association for Adult Education at Sorvik, during the same month; and the conference of the Library Association at Cambridge, England, in September. The International Library Committee accepted an invitation from the American Library Association to hold a meeting in Chicago in 1933, during the Century of Progress exposition.

Fellowships which served to promote international good-will were those granted to Joseph Vago, one of the architects of the League of Nations Library; Margaret Demchevsky, library organizer of the Bulgarian Ministry of Education; and Maria Teresa Chavez of the Cervantes Library, Mexico City. Miss Demchevsky's traveling fellowship and Miss Chavez' year of study at the Pratt School of Library Science were made possible through grants from the Carnegie Endowment for International Peace. A more recent Carnegie fellowship was granted to Kwan-tsing Wu of Nanking, China, for a year's study at the Columbia University School of Library Science.

Foreign Visitors.—Among recent distinguished librarians visiting the United States have been members of the Bodleian and Cambridge Library Commissions from England; Dr. Wilhelm Munthe of the University Library, Oslo; and Dr. Richard Oehler of the City and University Libraries, Frankfort.

FUNDS FOR LIBRARY WORK

In addition to sums appropriated by the Carnegie Corporation and Julius Rosenwald Fund, mentioned elsewhere in this article, the following notable grants were made for library work: a $10,000,000 trust fund for the maintenance of the Folger Shakespeare Memorial in Washington, D. C., the bequest of Henry Clay Folger; $2,000,000 for a new library building at the University of Cincinnati left by the late Charles P. Taft; $1,000,000 for the maintenance and operation of Dartmouth College Library, from G. F. Baker, donor of the building; a gift of $1,000,000 from the Charles Deering estate for a new library building at Northwestern University; a grant of $140,000 to the Library of Congress from the Daniel Guggenheim Fund for the Promotion of Aeronautics; the bulk of the $600,000 estate of the late Horace S. Oakley to the Newberry Library, Chicago, for the establishment and maintenance of a musical library.

NEW BUILDINGS

One of the important events in the American library world during the past year was the completion of the Sterling Memorial Library of Yale University, at a cost of $8,000,000. Other new buildings under construction or completed are: the Richmond, Va., Public Library at a cost of $500,000; the University of West Virginia Library, Morgantown, the first unit of which will cost $300,000; the Lake Forest, Ill., Public Library to be erected through a $250,000 gift from Mrs. Kersey Coates Reed and Mrs. Charles H. Schweppe; six new branch buildings at Queens, New York City, constructed at a cost of $1,430,000; the University of Cincinnati Library, completed at a cost of $900,000; the University of Tulsa Library, Okla., built with the $525,000 gift of Mr. and Mrs. R. M. McFarlin; the University of Tennessee Library at Knoxville, a $300,000 structure; a $250,000 library building at the Texas Agricultural and Mechanical College; the Edward Kirstein Memorial Branch in Boston, completed at a cost of $150,000; two new branch library buildings at St. Paul, erected at a cost of $94,000; and a $60,000 public library and art gallery on the Palos Verdes Estates, Calif. Among library buildings dedicated were: the library of the University of Oklahoma, Norman; the new half of the Toronto Public Library, Ontario; the $325,000 library of Loyola University, Chicago, the gift of Edward A. Cudahy; the Thomas Scott Buckham Memorial Library at Faribault, Minn., erected at a cost of $250,000; the Youngstown Public Library, a new $164,000 building; and the Randolph Macon Woman's College Library at Lynchburg, Va., a $150,000 building.

BIBLIOGRAPHICAL NOTES

Vollbehr Collection Purchased.—Important during the past year was the purchase by the Library of Congress of the Vollbehr collection of *incunabula* for $1,500,000. This collection consists of 3,000 books and includes a copy of the Gutenberg Bible, only two other perfect copies of which are known to exist.

New Bibliographical Association.—A new bibliographical society, the Inter-American Bibliographical Association, was organized by the Pan-American Union for the purpose of organizing and coördinating inter-American activities in the field of bibliography.

COGNATE SOCIETIES

GENERAL

American Academy of Arts and Letters, 633 W. 155th St., New York City.

American Academy of Arts and Sciences, 28 Newbury St., Boston, Mass.

American Booksellers' Assn., 15 Park Ave., New York City.

American Council of Learned Societies, 23 University Hall, Cambridge, Mass.

American Library Assn., 520 N. Michigan Ave., Chicago, Ill.

American Newspaper Publishers' Assn., 270 Madison Ave., New York City.

American Philosophical Society, Independence Sq., Philadelphia, Pa.

American Society of Composers, Authors and Publishers, 1501 Broadway, New York City.

American Society of Newspaper Editors, The Journal, Milwaukee, Wis.

Associated Press, 383 Madison Ave., New York City.

Assn. of Foreign Press Correspondents in the U. S., 66 Broadway, New York City.

Assn. of National Advertisers, 420 Lexington Ave., New York City.

Assn. of Newspaper Advertising Executives, Indianapolis News Bldg., Indianapolis, Ind.

Bibliographical Society of America, Grosvenor Library, Buffalo, N. Y.

German Press Club of N. Y., 21 Frankfort St., New York City.

Modern Language Assn. of America, New York University, New York City.

National Assn. of Book Publishers, 347 Fifth Ave., New York City.

National Editorial Assn., 131 E. 6th St., St. Paul, Minn.

National Institute of Arts and Letters, 633 W. 155th St., New York City.

National Publishers' Assn., 15 W. 37th St., New York City.

Peoples Institute, 70 Fifth Ave., New York City.

United Press Assn., 61 Park Row, New York City.

U. S. Publishers Assn., Inc., 522 Fifth Ave., New York City.

AMERICAN LITERATURE

American Dialect Society, Warren House, Cambridge, Mass.

Authors Guild, 2 E. 23rd St., New York City.

Authors League of America, Inc., 2 E. 23rd St., New York City.

Catholic Writers Guild of America, 128 W. 71st St., New York City.

National Assn. for American Speech, 2480 Broadway, New York City.

National Committee to Study Juvenile Readings, 1 Madison Ave., New York City.

Simplified Spelling Board, Lake Placid Club, Essex County, N. Y.

LANGUAGE AND LITERATURE

American Classical League, First National Bank Bldg., Princeton, N. J.

American Oriental Society, Yale University, New Haven, Conn.

American Philological Assn., Wesleyan University, Middletown, Conn.

Dante League of America, Inc., 15 Gramercy Park, New York City.

Dickens Fellowship of New York, 119 E. 19th St., New York City.

Grosvenor Library, 383 Franklin St., Buffalo, N. Y.

International Dante Society, 15 W. 107th St., New York City.

Modern Language Assn. of America, Bryn Mawr College, Bryn Mawr, Pa.

DIVISION XXVI

THE ARTS

ARCHAEOLOGICAL DISCOVERY

By Ralph Van Deman Magoffin
Professor, New York University

UNITED STATES

Arizona.—Arthur Woodward of the Los Angeles Museum has found proof of the oldest culture thus far discovered in the Gila River valley. In pits, in tombs that reveal a new type of cremation burial, were found finger rings and bracelets of carved shell, carved hard stone effigy bowls, painted bowls of pottery with very thin walls, pottery figurines, calcined bone awl-handles, etc., on nearly all of which were modeled motifs of birds and rattlesnakes.

New Mexico.—Hewett of the Museum in Santa Fé and the State University continued his work of last year in Chaco Canyon, bringing to light more evidence of the constructional powers of the Pueblos.

CENTRAL AMERICA

Uxmal.—Frans Blom of Tulane University has shown that that city was one of importance about 500 A.D. His most interesting discovery was a temple ruin in which was a nunnery, a nunnery quadrangle, and a shrine where the Vestals tended sacred fires. These buildings are to be used as a model for one of the buildings at the Chicago Fair.

British Honduras.—The British Museum Expedition has found a group of ruins between two of the branches of the Mojo river. In a cave were found mirrors of polished pyrites, stelae with datable Maya inscriptions of from the first to the third centuries A.D., and many pieces of Maya ceremonial pottery, all of which antidate by several centuries anything of Toltec make.

SOUTH AMERICA

Peru.—Dr. J. Tello of the Lima Museum has found in the so-called Nasca area, dating through the firs millennium B.C., an older pre-Nascan culture beneath the Nascan burials Their differences were at once forgotten, however, in the discovery ye lower of a culture older and of much higher order than either one. In caverns in the sand were found large mummy bundles—over 40 in one grave. With them were many well-modeled pieces of pottery which had green, blue, yellow, and red slips applied over incised designs. The pigments and method of painting are not yet ascertained. The vases look as if they had been painted with thick oils. The mummy bundles were each museums in themselves. The mummy was wrapped in alternate layers of cotton cloth and priceless textiles such as fringed robes of wool with symbols embroidered in colors, headdresses of skins, shawls, fans and wands of feathers. Among the textiles were scores of ornaments of gold, carved stone, turquoise, and shell. These layers were as few as eight, and as many as fifty. The mummies were decked with ornaments of gold, were found resting on their left sides against garments and utensils, and invariably in a large shallow basket.

GREAT BRITAIN

General.—Some sixty local excavations were made during the year. A number of neolithic camps were uncovered, a new Roman fort was discovered at Newbrough, near Hexham on Hadrian's wall, and a Roman barracks building of the legionary fort at Caerleon in Wales.

St. Albans.—The excavation at Verulanium (St. Albans) laid bare the pre-Roman defences, which were found to be on a colossal scale.

Anglesey.—At Bryn Celli Ddu the discovery was made of a bronze age tomb containing pattern-incised stones, and many pieces of bronze-age sculpture, with an interesting symbolic pillar.

Orkneys.—In what has been called a "Stone Age Pompeii" a number of houses of about 200 B.C. have been uncovered. They are quite similar, each containing one room that is a combination kitchen, living room, and bedroom, in which is a stone dresser, a tank for live fish, a central hearth, a bed, and a concealed door that leads to a sort of cache or treasure room.

ITALY

Renewed Concessions.—The most important archaeological event is the published willingness of Italy to have foreigners resume excavations in Italian territory, a privilege that has been in abeyance since the beginning of the Italo-Turkish war. The resumption of this privilege is for the most part due to the recommendations of the newly formed *Associazione Internazionale degli Studi Mediterranei*, of which Count D. A. Costantini is president.

Rome.—Two new museums have been opened: the *Museo di Roma* for objects from post-classical Rome, and the *Museo Storico Retrospettivo del Fascio Littorio* for all objects bearing the symbol of the fasces, from the time of the Roman Republic to the end of the nineteenth century. The nucleus of the collection is the gift of Count A. Contini-Bonacossi. The forum of Augustus, the theatre of Marcellus, and the bazaar-like market in Trajan's forum have been nearly cleared. A new piece of the Servian wall has been found near Viale Aventino. Several splendid sarcophagi have been found in the catacomb of St. Pretastato, which is near the catacombs of St. Calixtus and St. Sebastian. They are now on view in the catacomb's museum. The finest one has in relief on one side a wild beast hunt, and among the hunters are Castor and Pollux. Other reliefs show an admixture of the older figures of ancient mythology and the newer Christian symbolism. At the front of the Capitoline hill on the north, between the Altar of Italy and the steps leading up to the church of *Sta. Maria in Ara Coeli* the remains have been found of a private house which had at least seven stories. This is the largest building of the kind thus far found in Italian territory.

Calabria.—At Gioiosa Ionica on the coast, in a newly excavated theatre have been found, for the first time in position, amplifiers made from terra cotta jars.

Lake Nemi.—The barge of Caligula nearer to the shore is now quite out of the water, and is being installed under a wooden canopy which is to be part of a new museum in which will be housed most of the things that have been or will be found on both barges. The latest discovery of note is a bronze anchor eleven feet long, and several pieces of a rope hawser. Divers brought up recently from the second barge, which is not to be raised, a fine double herm of bronze.

Sarsina.—A well-preserved ancient necropolis, which has been preserved in the mud that was the result of a landslide caused by the deviation of a river, has been found in Northern Umbria. It dates from the time of the Republic into the period of the early Empire. The Roman writer of comedy, Plautus, was born at Sarsina in 251 B.C. Many of the sculptures found show the simple but stern facial characteristics of the north Italians of 150 B.C. to 100 A.D. The monumental grandeur and splendid niche decorations of the mausoleum of Murcius Obulacus is eminent among the rest, but all are noteworthy. They show the adaptation of Greek art by early Italian architects and sculptors. In all the houses are fine mosaic floors, many pieces of marbles, and much wall painting. The city *thermae* or Baths, are being excavated at the present time.

Ardea.—Lugli has done good work at Ardea in laying bare the ancient ruins in preparation for the visits of pilgrims during this year, that of the bimillennial of Virgil's birth.

Aquileia.—The ancient river gate and a long stretch of the city's wall has been excavated during the year.

Sicily.—At Himera, a temple erected in 480 B.C. to commemorate the victory of the Sicilian Greeks over the Carthaginians has been cleared. In the colonnades were found many good pieces of plastic sculpture, among which were some forty colossal lion heads, painted in rich bright colors, which had once adorned the eaves or comb of the roof.

Isola Sacra.—The sensation of the year was the accidental discovery, in the "sacred island" between the Tiber and the new imperial canal from it to Fiumicino, of a second century A.D. necropolis. Guido Calza at once came over from Ostia, where he is director of excavations, and laid bare several streets of what was a cemetery built like a town. The tombs are mostly of brick, with brick decorations. Paintings, inscriptions, amphorae, stucco reliefs, were found in abundance. There were also many small tombs of a vaulted form unlike anything previously found. They are like Syrian tombs of the 5th to 8th centuries B.C. The necropolis was built by the workmen of the seaport for their own dead. Premier Mussolini was so impressed by the discovery that he at once gave Calza 100,000 lire for his work, said to be an earnest only of a million or more, enough to clear the cemetery completely.

ALBANIA

Butrinto.—At the ancient site of Buthrotum, in the excavation of public buildings of the third century B.C., Ugolini found a magnificent statue of a goddess which he attributes to Praxiteles.

AUSTRIA

Vinca.—Near Belgrade, M. M. Vassits of Belgrade University has found a centre of Aegean civilization of the second millennium B. C. on the bank of the Danube. Several successive settlements one above another were found and excavated. Houses built of wattle and daub supported by wooden posts, statuettes—quite certainly cult objects—stemmed bowls and anthropomorphic vases, and several pieces of "Minyan ware," give the date of the great new discovery.

Ancient Noreia.—Excavations at S. Margarethen have brought to light houses and much pottery of the late Celtic period (second to first century B.C.). Near the site have been found also the "gold and silver pits" mentioned by Strabo, and the remains of the iron mines for which ancient Noreia was famous.

YUGO-SLAVIA

Stobi.—About three miles from Gradsko on the Vardar River a Greek theatre has been found which is clearly one of the best thus far discovered. A large basilica and an important residence, perhaps that of the governor, both of them with intricately patterned mosaic floors, have also been uncovered.

CYPRUS

Vouni.—Here a palace, much like those of ancient Minoan Crete, has been found. In it, statuary, gold necklaces, amulets, earrings, and fingerrings of gold, show a connecting link between Cyprus and Egypt. Many silver bracelets, 249 silver coins, several bowls of silver, and some finely painted Greek vases, all of the fifth century B.C., are part of the recent discoveries that show Cyprus as an archaeological field of great potential importance.

GREECE

Euboea.—The splendid bronze god discovered in 1928 off the island of Euboca is now identified as a Poseidon. It dates about 460 B.C., i.e., between the pedimental sculptures of Olympia and the Parthenon. It therefore has special value in that it illustrates an obscure period of fifth-century work

Corinth.—T. Leslie Shear has continued his work with great success. More complete clearance of buildings already partly excavated has been made, and scores of fine pieces of sculpture and hundreds of pieces of pottery have been found. Notable is the unearthing of a beautiful golden necklace, and a hoard of 51 gold staters of Philip and Alexander the Great.

Cnossus.—An outer entrance system to the palace on the western side and a fortified entrance camp there have been found. Several sanitary refuse pits were found on the border of the west court, fortifying the earlier proofs of the wonderful sanitary arrangements of the palace. In two circular pits were found much broken pottery illustrating the best ceramic art of the Middle Minoan period.

EGYPT

Matmur.—The Brunton Expedition of the British Museum has laid bare a temple built by Rameses II in honor of the god Set.

Karanis.—In the Fayum the Expedition of the University of Michigan has cleared the temple site of Pnepharos and Petesuchos.

Meydum.—Alan Rowe of the University of Pennsylvania Expedition has made sensational discoveries in and near the pyramid. He discovered the sepulchral chamber and the false entrance and stairway, and laid bare the causeway of 227 yards in length—the first ever entirely excavated—leading from the pyramid temple to the valley temple. Near the pyramid he discovered a pit in which were 101 mummies, in coffins stacked up in helter-skelter tiers, dating from 1200 to 2000 B.C.

PALESTINE

Tell Beit Mirsim.—In the continuation of the excavation of the Biblical site of Kirjathsepher, near Hebron, eleven strata, six of them of the Middle Bronze Age, have been distinguished. In them the excavators found data for a complete chronology of Palestine. In the late Canaanite stratum (C) there were two scarabs, one with the cartouche of Amenophis III (1411-1375 B.C.), and the other of the time of Rameses the Great. which proved that stratum C lasted into the fifteenth century B.C. In the same level was found a limestone lion of Canaanitish workmanship. This is the first stone lion of pre-Roman date found in Palestine.

Tell Fara.—At Beth-pelet, 18 miles from Gaza, Sir Flinders Petrie finds in many objects of gold and silver and in scarabs, proof of occupation from Hyksos to Roman times. In what he calls the "Egyptian Residency" of about 1300 B.C. was discovered a box with a band of ivory veneer on which had been engraved by a Syrian artist on Egyptian scene that gives vivid pictures of the life of the times. He finds proof that the Hyksos dynasties XV and XVI were contemporaneous with Egyptian dynasties XIII, XIV, and XVII, which gives a linking date between Egypt and Palestine of 1587 to 2375 B.C.

Petra.—Shaft graves in rock-cut tomb chambers show evidence of burial in quick lime, apparently a unique practice in antiquity. This may throw light on the claimed derivation of the word sarcopahgus, which means "eater of the body."

SYRIA

Ras Shamra.—In northern Syria terra cotta tablets have been found which bear cuneiform texts in a script—alphabetic and with 26 signs—hitherto unknown. They were discovered in a royal library and are dateable by the other finds as of the second millennium B.C. Near the tablets was found a hoard of 74 bronze weapons and tools, comprising swords, axes, spears, arrows, spades, sickles, and scissors.

MESOPOTAMIA

Ur.—The finds this year had more of historical than of sensational interest. The city wall of Ur was found to be 2½ miles in its circuit. The canal harbor was located, and Nebuchadnezzar's temple was partly cleared. The discovery of a segmentally molded column of eight mud bricks round a central circular brick, dating from the III Dynasty of Ur (c. 2300 B.C.), has finished upsetting the old theory that no columnar building dates before the Parthian period. Copper and mosaic pillars have been found at al-Ubaid, and mud brick columns at Kish. Mr. Woolley's discovery, at a depth of 60 feet below a stratum dating at least as early as 3200 B.C., of several clay figurines of women with bird-like heads, black wigs, and on whose broad shoulders are mysterious tattoo marks of some kind, has given him the right to claim that he has found the earliest pieces of Mesopotamian sculpture.

Tell Halaf.—No account of the surprising discoveries near the source of the Khabur River in northern Mesopotamia, begun in 1911 by Baron von Oppenheim, has been made. The cartouche of Kapara, an Aramaic prince, son of Hadianu, was found on some of the blocks of a composite temple and palace building. The statuary resembles the oldest Sumerian works of art. There is a parallel between the rock temple statues at Abu Simbel in upper Egypt and the triad of ancient "Hittite" gods found serving as caryatids in the entry of the palace-temple. These three colossi, dating about 2000 B.C., have been set up in Charlottenburg by the Baron in his private museum, using both originals and casts in his attempt to reconstruct the appearance of the facade of the temple he excavated.

CHINA

Yellow River.—The discovery by French scientists along the banks of the Yellow River in East Shensi of paleolithic implements resembling those of the mousterian culture associated with Neanderthal man, has created considerable stir among the "pre-historians."

PAINTING

BY FRANCES M. HENDERSON
AMERICAN FEDERATION OF ARTS

INTERNATIONAL EXCHANGE OF EXHIBITIONS

American Art At Venice.—One of the most significant developments in connection with the art of painting in recent years is the frequent interchange of exhibitions of such work among nations, demonstrating anew the fact that in the field of art there are no boundaries of time or place. The year 1930 witnessed greater activity in this respect than has been recorded by any of its predecessors. American painters were well represented in the great Biennial Exposition of Paintings held in Venice, Italy, during the summer months. Through the gift of Walter L. Clark, President of the Grand Central Art Galleries, New York, an American pavilion was erected in the Exposition grounds, on land donated for the purpose by the Italian Government, wherein henceforth the art of our country will be shown on an equal footing with that of other nations at these International Expositions. The gallery was designed by Delano and Aldrich, well known New York architects, in American colonial style, and admirably fills the need for which it was erected. The American collection this year was assembled by the American Federation of Arts, the National art organization, in coöperation with the Grand Central Art Galleries, and comprised works by 89 painters, with a few small bronzes included. The leading artists of both conservative and advanced schools were represented, the former, however, in the majority.

Budapest.—An exhibition of paintings by well known American artists was assembled early in the year and sent to Budapest, where it was shown under the joint auspices of the American-Hungarian Foundation and the American Federation of Arts, and the patronage of distinguished committees composed of high government officials of this country and Hungary.

As an exchange exhibition, a collection of Hungarian art—paintings, sculpture and craft work—was assembled by the American-Hungarian Foundation and sent on a circuit of American museums.

Stockholm, Copenhagen, Munich.—Under the auspices of the American-Scandinavian Foundation and the American Federation of Arts, a similarly notable collection of American paintings, selected by George William Eggers, then Director of the Worcester Art Museum, was shown first in Stockholm and later in Copenhagen and Munich, attracting in each of these cities very favorable comment and criticism.

Canadian and Mexican Art in U. S.—Exhibitions of paintings by contemporary Canadian artists, and of Mexican Arts, were also shown in the leading art museums of the United States and widely visited. The Canadian paintings were assembled in Canada by Eugene Savage, a distinguished American mural painter; the Mexican exhibits by Homer Saint-Gaudens, Director of Fine Arts at the Carnegie Institute, Pittsburgh. Both exhibitions were made possible by grants from the Carnegie Corporation of New York to the American Federation of Arts.

Other Foreign Art Shown.—Collections of Austrian paintings and of contemporary French paintings, the latter comprising approximately 85 works, were brought to this country by the College Art Association and circulated among colleges and art museums. An exhibition of Brazilian Art was assembled and circulated among art museums and associations in the United States under the auspices of the Brazilian Friends of the Roerich Museum, New York. Finally, a group of 75 water colors by members of the Royal Society of British Artists was similarly brought to the attention of the American public by the American Federation of Arts.

International Exposition at Pittsburgh.—And in this rather amazing listing of foreign exhibitors in our land during the past twelve months, mention has still to be made of the Twenty-ninth Internatioanl Exhibition of Contemporary Painting set forth at the Carnegie Institute, Pittsburgh, from Oct. 16 to Dec. 17, wherein the works of artists of twelve European nations were shown with those of our own country. An interesting fact in connection with the European representation in the exhibition this year was that artists of Soviet Russia made contribution for the first time. The American committee of selection for this exhibition was composed of Charles Burchfield, Bernard Karfiol, Ross Moffett, Horatio Walker and Emil Carlsen. Three of these artists—Carlsen, Karfiol and Moffett—also served on the jury of award, which was composed in addition, of Henri Matisse of France, Karl Sterrer of Austria, and Glyn Philpot of England. Two of the cash awards were made this year to Americans—the Second Carnegie prize of $1,000 (together with the Lehman Purchase Prize of $2,000) to Alexander Brook of New York for a Still Life; and First Honorable Mention and $300 to Henry Lee McFee of Woodstock, N. Y., likewise for a Still Life. Maurice Sterne and Niles Spencer of New York were also accorded Honorable Mention. The First Carnegie Prize of $1,500 went to Pablo Picasso of France, for a portrait of Madame Picasso; third prize of $500 to Charles Dufresne, also a Frenchman, for a Still Life.

CORCORAN GALLERY BIENNIAL EXHIBITION

Scope of Representation.—Probably the outstanding event in the field of painting during the year was the Twelfth Biennial Exhibition of Contemporary American Painting shown at the Corcoran Gallery of Art, Washington, D. C., from Nov. 30 to the end of December. This was one of the most representative exhibitions of its kind ever held, and highly significant of present day trends in painting. The works included were selected by a jury composed of Daniel Garber, Chairman, Childe Hassam, Leon Kroll, Charles Hopkinson and Adolphe Borie—so called conservatives, with perhaps one exception; yet among the 395 paintings shown there was approximately equal representation of the advanced and academic schools.

Prize awards, which were made by this same jury, were as follows: 1st Clark prize of $2,000 and Corcoran Gold Medal, to Maurice Sterne for a Still Life, "After Lunch"; 2nd Clark prize of $1,500 and Corcoran Silver Medal, to Gifford Beal for a painting of a "Circus Girl"; third Clark prize of $1,000 and Corcoran Bronze Medal to Edmund Archer for a painting of a "Show Girl"; and 4th Clark prize of $500 and Corcoran Honorable Mention to Joseph M. Plavcan for a painting of "Mechanic Street, New Hope, Pa." The Popular Prize of $200, awarded by vote of visitors to the exhibition during one week, went to a painting by William M. Paxton entitled "Two Models."

Purchases For Gallery Collection.—From this exhibition four paintings were purchased for the permanent collection of the Corcoran Gallery—the First Prize Painting, "After Lunch" by Maurice Sterne; "Demeter and Persephone" by Bryson Burroughs; "Early Morning" by John Noble, and "River Barges" by John R. Grabach.

MURAL PAINTING

Augustus Vincent Tack.—In the realm of mural painting especial interest attaches to the series of decorative panels completed by Augustus Vincent Tack for the walls of the Library in the Phillips Memorial Gallery, Washington, D. C. These paintings, which are purely abstract, are considered by many one of the most notable artistic achievements of the present day. In them the artist has expressed not forms but rather emotions, which each individual must interpret according to his or her own spiritual understanding. These paintings, chiefly notable for their color harmonies, have been characterized by the artist as "playgrounds of the imagination." They must be seen to be comprehended or appreciated. Augustus Vincent Tack also executed two panels, representing the Nativity and the Ascension, for the Church of St. Agnes, at Dalton, Mass.

Boardman Robinson.—A series of mural paintings depicting the History of Commerce, from the early days of the Persians and Arabs, was completed by Boardman Robinson for the Kaufman Store in Pittsburgh. In recognition of this achievement the Architectural League of New York awarded its Gold Medal of Honor for Decorative Painting to Mr. Robinson.

Eugene Savage.—Two monumental decorations, "The Armistice" and "Paths of Peace", by Eugene Savage, were placed in the grand reception room of the Elks National Memorial in Chicago, a notable addition to the architectural design of the building.

Rockwell Kent, in collaboration with Jo Mielziner, executed his first work in this field—a ceiling decoration for the new Cape Cinema Playhouse, at Dennis, Cape Cod, Mass. This painting, a modernistic conception of the heavens, is said to be the largest single canvas ever executed, covering more than 6,000 square feet.

J. Monroe Hewlett.—Constitution Hall, the new auditorium of the Daughters of the American Revolution, in Washington, D. C., acquired a series of four mural hangings by J. Monroe Hewlett, for placement at the back of the stage. These hangings are painted in *tempera* on coarse linen, and represent the four cities—Boston, New York, Philadelphia and Charleston—in early Colonial days.

Jonas Lie.—A large mural painting by Jonas Lie was placed in the chanel of All Soul's Unitarian Church, Plainfield, N. J. The painting was presented to the Church by the artist, as a memorial to his wife and a token of friendship to the community which had befriended him in his youth. The subject was a landscape, inspired by the 24th Psalm.

State Capitol Murals.—In the Flag Room of the State Capitol at Albany, N. Y., mural paintings depicting eight battles of major significance in the history of New York state, were installed. The paintings are the work of William De Leftwich Dodge. Another State Capitol—that at Montgomery, Ala.—was similarly enhanced, murals by Roderick Mackenzie, depicting eight outstanding events in the history of the State, being placed in the rotunda. In the Law Library of the State Capitol at Lincoln, Neb., a mural painting by Elizabeth Honor Dolan entitled "The Spirit of the Prairie" was installed.

Chrysler Building.—In New York City, the center of much of the activity in this field, a large mural painting was completed by Edward Trumbull for the Chrysler Building. The work is 96 feet long, triangular in shape, and shows the skyscraper as its central theme.

Ezra Winter completed a series of murals of Old New York for the new quarters of the Manhattan Trust Company, New York City. Mural paintings by Mr. Winter were also placed in the Public Library at Birmingham, Ala.

Chernoff.—A painting of the "Ascension", by Vadim A. Chernoff was completed for the Church of the Strangers, New York City.

Field Museum.—Five large murals by Charles R. Knight were added to the series of restorations of prehistoric life in the Ernest R. Graham Hall of the Field Museum of Natural History, Chicago. A series of 28 paintings of this character are being presented to the Museum by Mr. Graham, of which 21 have now been installed.

University of Virginia has a notable mural painting, historical in theme, which was completed for the French Room in the building devoted to Romance Languages. The painting was executed by St. Hubert, a French artist, and depicts, among other incidents in the history of the University and the State, Lafayette's visit to Monticello.

Los Angeles Museum of History, Science and Art, instituted during the past year an international competition for murals to decorate its projected Mural Hall, the subject of the works so produced to be "The Dynamic of Man's Accomplishment from the Earliest Times to the Present." In this competition first, second and third prizes, respectively, were awarded to Erwin Hetch and Karl Exter of Bavaria, and Xavier Gonzales of San Antonio, Tex.

Miscellaneous.—In the First National Bank of La Jolla, California, a mural painting by Hugo Ballin was installed. This painting sets forth events in the history of the State, from the arrival of the first ship in San Diego Bay to the present time. A fresco by Jose Clemente Orozco, depicting Prometheus bringing fire to humanity, was placed in Frary Hall, Pomona College, Claremont, Calif. Ernest Peixotto completed a series of eleven mural paintings for the residence of John Cravens in Pasadena, which, before being installed, were exhibited at the Grand Central Galleries, New York. In the Groos Bank, San Antonio, Tex., a mural painting by Paul R. Cook, showing events in the early history of the institution, was installed.

FELLOWSHIPS AND AWARDS

Rome.—The annual fellowship in Painting of the American Academy in Rome was awarded this year to Salvatore de Maio of New Haven, Conn., a student of the Yale School of Fine Arts.

Guggenheim Foundation.—Fellowships in Painting were awarded by the Guggenheim Foundation to Mordi Glassner and Monty Lewis of New York; and to Pamela Bianca, who is best known as an illustrator. The painter members of the committee of selection for these awards were Howard Giles and Charles Hopkinson.

The Architectural League of New York, in addition to its Gold Medal of Honor for Decorative Painting awarded to Boardman Robinson, of which mention is made above, bestowed honorable mention upon Suzanne Miller of New York for her painting, "The Waterfall" and D. Putnam Brinley for his decoration in the Brooklyn Savings Bank, entitled "Brooklyn — Past, Present and Future."

Elihu Root Award.—A Gold Medal for "distinguished services to the Fine Arts" was awarded Elihu Root by the National Academy of Design.

ART SALES

In reviewing the sales of works of art held during the season it is interesting to note that the American Art Association-Anderson Galleries, Inc., of New York, report a sales total of $4,603,253.20, of which $2,792,486 was paid for paintings. One hundred thousand dollars, a record price for an American painting, was paid for Winslow Homer's "Eight Bells." The painting was purchased by Thomas Cochran of New York and presented to the Addison Gallery of Phillips Andover Academy, to be opened earl in the Spring of 1931.

NECROLOGY

The year 1930 witnessed the passing of two outstanding figures i American painting—Gardner Symons one of the leading contemporary landscape painters, whose death occurre at Hillside, N. J., Jan. 12, an Charles W. Hawthorne, distinguishe as both painter and teacher, who die at Johns Hopkins Hospital, Baltimore, Nov. 29.

SCULPTURE

By Rose V. S. Berry

Writer and Art Critic

INTRODUCTORY

With five all-sculpture exhibitions; with the inauguration of the Modern Museum of Art, in New York; with the opening of several sculpture courts in the museums; with a number of exhibitions of garden sculpture, and upwards of fifteen one-man sculpture shows, it is a recognized fact that more American sculpture, by a larger number of sculptors, has been seen this year by a greater American and foreign public, than ever before. The character of the sculpture shown has surprised and enthused the critics. New tendencies and interesting developments are evident. Variety in texture and unexpected color prevail. The diversity of media is endless. The sculptor is experimenting with gold and silver and composition metals, which supply color. He is making use of polychromed cement and wood, colored marbles, and bronze patinae. Among the sculptors are experimentalists and traditionalists. The older men present meticulous modeling true to conservative ideals. The younger men, especially the *Prix de Rome* group, show excellent craftsmanship, and, along with their French-trained confreres, offer work tinged with foreign influence, fanciful and decorative. The youngest men, often foreign born, are sympathetically organizing greater masses regardless of academic law. Charming style and individuality belong t another group, while others are having a fling with the abstract. A few in the East, and a coterie of friend in San Francsico, have turned to th art of the old sculpères, direct cuttin in stone.

EXHIBITIONS AND GALLERIES

San Francisco.—The favor sculpture has found in the eyes of the public is due to the fact that it has bee exhibited in its proper setting an apart from painting. The exhibitio in San Francisco, the prototype o the other all-sculpture shows, close in January, 1930, after having bee extended several months and seen b hundreds of thousands of people. Th exhibition dissolved into a number o one-man shows, to be reassembled very largely, later in Brooklyn an Philadelphia.

Brooklyn.—For the inauguratio of its large sculpture court, th Brooklyn Museum held an exhibitio of the work of the living sculptors including those of foreign birth, o New York and vicinity. The exhibition was of high standard, impressiv in merit and numbers. One hundre and thirty-five sculptors showe nearly 600 pieces. In addition to th work of the living men, museums friends, and the families of the lat

Charles Grafly and Charles Cary Rumsey, assembled a memorial collection for each.

Philadelphia.—The Art Alliance of Philadelphia, held the sixth Out-of-door Biennial Exhibition of sculpture in Rittenhouse Square. This exhibition was taken in its entirety to Harrisburg, Penn., and a series of cities will probably take the next Rittenhouse Square Biennial.

New York.—The Fifty-sixth Street Galleries featured Gleb Derujinsky and Lucy Perkins Ripley, while among the sculptors exhibiting were: Allan Clark, Hunt Diederich, Robert Laurent, Arnold Geissbuhler, Jo Davidson, Bruce Moore, Paul Manship, Mario Korbel, Malvina Hoffman, Wheeler Williams, and Roy Sheldon. In addition to these, William Zorach, Reuben Nakian, and Duncan Ferguson were included in the "33 Moderns" exhibiting at the Grand Central Art Gallery. Seven sculptors, Alexander Archipenko, Allan Clark, Gleb Derujinsky, Boris Lovet-Lorski, Paul Manship, Hishan Toor, and Heinz Warneke, were shown in a group at Helen Hackett's Gallery. Other sculptors shown at the Modern Museum of Art, in May, included Harold Cash, Duncan Ferguson, Isamu Noguchi, and Ben Schrnuel. Comprehensive exhibitions of garden sculpture were shown at the Arden, Ferargil, and Grand Central Galleries. At the Fifty-sixth Street Galleries, the sculptors arranged the landscape setting and installed their own garden pieces.

Miscellaneous.—Important exhibitions of sculpture were held for the opening of sculpture courts in the museums of Houston, Tex.; Dayton, O.; Grand Rapids, Mich.; at the Museum of Modern Art; the Fifty-sixth Street, and the Marie Harriman Galleries in New York. The announcement was made of a new museum devoted to American Art, sponsored by Gertrude Vanderbilt Whitney. No small event was more sensational than the Proctor and Gamble competition for carvings in white soap. carvings were submitted from every state in the Union, from Canada, France, Italy, Belgium, Austria and Switzerland. There were 4,900 carvings shown. Eighty-nine honorable mentions, and some twenty prizes were given in professional, amateur, senior, and junior awards. The monument to the early settlers of New England was unveiled in Worcester, Mass, early in the season, and the "Pioneer Mothers" was presented by A. W. Marland to the citizens of Oklahoma.

AMERICAN SCULPTURE ABROAD

Budapest and Venice.—Under the auspices of the American Federation of Arts, and the Grand Central Art Gallery, a collection of American paintings and sculpture was shown early in the summer at Budapest. Under the same supervision and auspices, a second collection of American paintings and sculpture was taken to Italy, by Walter L. Clark, President of the Grand Central Art Gallery. At the Venetian Biennial, this collection was combined with the one from Budapest to make the initial showing in the new American Pavilion, built given by Mr. Clark. Among the sculptors exhibiting were Hunt Diederich, John Gregory, Leo Friedlander, Malvina Hoffman, Anna Hyatt Huntington, Edward McCartan, Hermon A. MacNeil, Paul Manship, Albin Polasek, A. Phimister Proctor, and Adolph A. Weinman.

Czechoslovakia.—The year 1930 has seen important sculpture take permanent position in Europe. Albin Polasek of the Chicago Art Institute, and this year, visiting professor at the American Academy in Rome, presented three heroic figures—pagan god Radigost, and Saints Cyril and Methodius—to his native village in Czechoslovakia.

France.—Paul Manship has completed the American War Memorial for Thiacourt, France, and C. Paul Jennewein has completed the War Memorial for Tours, France.

Canada.—R. Tait McKenzie has completed a War Memorial for Canada. Charles Keck has completed a Peace Memorial for Toronto. Evard Fairbanks has done a Pioneer Mother monument for British Columbia.

Venezuela.—In conjunction with

the National Fine Arts Commission in Washington, D. C., the late Edmond Quinn was doing a large statue of Henry Clay, for Caracas, Venezuela, Francis H. Packer completing this work.

Iceland.—Stirling Calder, in the same way, is working upon a portrait statue of Leif Ericson, to be placed in Reykjavik, Iceland.

ONE-MAN EXHIBITIONS

Alexander Archipenko.—His small sculpture was shown with notable success in Los Angeles.

Allan Clark.—This sculpture combining an oriental and classical spirit has been greatly admired, but the recent exhibition at the Wildenstein Galleries surpassed all former modeling in Clark's portrayal in wood of the hopeless resignation and mysticism of the American Indian.

Harold Cash, at the Weyhe Gallery, showed an interesting group of sculpture in which he gave occidental interpretation of Indo-Chinese types. He had an indifferent American success, but was readily accepted on the continent; his work has been proposed by Roger Fry for the Tate Gallery in London.

Margaret French Cresson.—Her retrospective exhibition, at the Grand Central Galleries, contained some interesting portraits and reliefs of children, though "Francesca," a woman of quaint beauty, was the outstanding characterization.

Jo Davidson, at the Marie Harriman Gallery, gave further evidence of his versatility. He stacks up a head with thumb strokes or models in detail for a likeness. He presents a subject as exact as "Torso" or as abstract as his groping "Dawn." Portraits of G. B. Shaw, D. H. Lawrence, and James Joyce were among his recent subjects.

Gleb Derujinsky, at the Hackett Gallery, showed excellent craftsmanship, neither modern nor academic; with a fresh vision he attains variety by working in Belgian marble, terra cotta, bronze and wood.

Alfeo Faggi, at the Ferargil Gallery, held a nine years' retrospective exhibition, in which he fused the spirit of today with the mysticism of the Italian Primitives, while his portraits of Noguchi, Takashi Ohta, and Robert Frost, though non-photographic, have a sensitive likeness.

Heinz Warneke.—His show, at Milche's, included late European work which is vital and life-like with a definite style, full of character embracing humorous action, with variety in medium and distinctive personality.

Wheeler Williams, at the Ferargil Gallery, showed beauty of form and simplicity of design. Educated as an architect, he revealed his sound training by the charmingly formal balance in decorative figures and portrait busts.

Isamu Noguchi, at Marie Sterner's Gallery, showed some excellent portraits; in these 15 heads he is the psychologist, poet and craftsman.

C. Paul Jennewein gave a retrospective one-man-show in which he demonstrated his delightful use of color, and the irresistible cupids (portraying a small son).

Roy Sheldon, interested in monumental sculpture, achieved admirable simplicity with modern tendencies. A cream onyx portrait in his one-man show added to his reputation.

Lawrence Tenny Stevens attained classical charm in delicately colored marble heads while the same precision in his treatment of animal form gave simplicity and directness.

PRIZES AND AWARDS

John Simon Guggenheim Foundation Awards for creative sculpture were assigned to: Harold Cash, Richmond, Va.; Bruce More, Wichita, Kan.; Sidney Loeb and Arthur Lee, New York City.

Pennsylvania Academy of Fine Arts awarded the Widener Prize to "Torso" by Mitchell Field; and the James McClees Prize to "Boy and Faun" by Gaetano Cecere.

National Academy of Design awarded Ellen Speyer Memorial prize to "Ibex" by James L. Clark. Paul Manship won the Speyer prize of the National Academy of Design in the Spring Show.

Architectural League of New

York awarded Avery Prize to "Leda" by Albert T. Stewart.

Chicago.—Chicago artists awarded Shaffer prize for creative sculpture to "Watching the Dance" by Edith Boynton. Chicago Art Institute awarded John C. Shaffer prize for portraiture in any medium to Ruth Sherwood. A $2,500 cash prize of the Chicago Art Institute was awarded to Heinz Warnecke.

Woman's Painters and Sculptors awarded Anna Hyatt Huntington prize to "Deer" by Ilse Niswonger.

National Arts Club awarded prize to "The Mask" by James E. Fraser; Medal of Honor to "Diana" by Edward McCartan.

Beaux Arts Institute awarded its sculpture prize, carrying with it one year's study in Paris, to Leonard Mitchell, of Scranton, Penn.; second prize to Michael Lantz, third prize to Ray Wever.

Miscellaneous. — Fairmount Park Art Association awarded cash prize of $1,000 to Oronzio Malderelli; Art Alliance cash prize of $500 to Carl Milles; Art Alliance cash prize of $500 to Arthur H. Lee; Garden Club awarded Gold Medal to Albert Henry Aitkins. San Francisco Art Association awarded the First Sculpture prize to "Portrait of George Sterling, the Poet" by Ralph Stackpole. Garden Clubs awarded prize to "Herons" by Paul Herzel.

CURRENT SCULPTURE ACTIVITIES

Among activities in 1930 were: Lawrence Tenny Stevens, bronze memorial doors, to Thomas Fortune Ryan, in Oakridge, Va; Edmond Amateis, three bronze fountain figures, for R. B. Mellon, Pittsburgh; C. Paul Jennewein, sculpture for South Office Building, Harrisburg, Penn., Akroteria for Philadelphia Art Museum, bison head keystones, spandrels, American eagles supported by fasces at the Virginia end of the Arlington Memorial Bridge, Washington, D. C.; Charles Keck, decorative panels for Waldorf Astoria Hotel, busts of Patrick Henry and Elias Howe, for Hall of Fame, New York University; Leo Friedlander, relief for Genessee Valley Trust Co., Rochester, N. Y.; 28 figures for Jefferson County Court House, main central pediment for Museum of the City of New York, tympanum and three figures for Christ Church, Grosse Point, Mich., two colossal equestrian groups for Arlington Memorial Bridge, Washington; Hermon A. MacNeil, monument to Thomas Burke, Seattle, granite Memorial to Pilgrim Fathers, Waterbury, Conn., portrait statue of General Terry, State Capitol, Hartford, Conn., memorial for Charleston, S. C.; Thomas Hudson Jones, memorial figure (ten feet high) for Portchester, N. Y., and completion of relief and wreathes for Tomb of Unknown Soldier, Arlington, Va.

John Gregory, worked upon nine life-size panels presenting incidents from Shakespeare's plays, for the Folger Shakespeare Library, Washington, D. C. John Manship has placed Armillary Sphere (eight feet in diameter); a fountain, Venus Anadyomene, at the Philips Academy, Andover, Mass., and has been working for three years on the great bronze gateway for Bronx Zoölogical Park, New York; model for Abraham Lincoln, as a youth, for Fort Wayne, Ind.; statue of General Grant to be placed in front of the Grant Tomb, Riverside Drive, New York. James E. Fraser worked on a twice-life-size statue of Lincoln to mark eastern end of Lincoln Highway; equestrian statue of Roosevelt for the Roosevelt Memorial, New York City; colossal groups for the end of Arlington Memorial Bridge, Washington, D. C. Robert Aitken was selected to do sculpture for Gompers Memorial, Washington, D. C. Leo Lentelli was selected to do statue of Cardinal Gibbons, to be placed in front of Sacred Heart Church, Washington, D. C. Andrew O'Connor worked on the heroic statue of Abraham Lincoln to be placed before State Capitol at Providence, R. I. Laura Gardin Fraser began "Air," an allegorical group, for Elks' Memorial in Chicago. Lee Lawrie's "The Sower" was completed for the finial of the dome of Nebraska's State Capitol. Albin Polasek completed life-size figures of Saints Cyril and Methodius for Slavonic Chapel, St. Paul, Minn. Ettore Cadorin did "Junipero Serra" for Statuary Hall, Washington, D. C. Henry Hering did three figures (twenty-two feet high) for Civic Center, and lions in buff sandstone for War Memorial, Indianapolis, Ind. Ralph Stackpole made one group "Progress of Man" and two massive figures (twenty-two feet) cut directly in stone of the San-Francisco Stock Exchange. Alfeo Faggi did doors carved in wood for St. Joseph's Chapel, Woods Hole, Mass., and Sidney Bedore, a Pere Marquette group for Green Bay, Wis. John Brcin did reliefs and two equestrian statues for the new Court House, Omaha, Nebr. Lawrence Crunelle, a life-size portrait relief, World War Sailor, St. Adelbert's Cemetery, Chicago, Ill., and Emory Seidel, Marquette Monument for Damen Avenue Bridge, Chicago. Lorado Taft did the Charles Page Memorial, Sand Springs, Okla., "Crusader" monument for Victor Lawson's grave, Chicago, bust of Victor Lawson for Illinois Hall of Fame and bust of Henry W. Clendening for Illinois Hall of Fame. Nellie V. Walker did "Socrates" and "Moses," two 12-foot figures, for County Court House, Jackson, Miss., four marble reliefs in library at DeKald, Ill., and bronze wall fountain for Sullivan Junior High School, Chicago.

ARCHITECTURE

By Harry Francis Cunningham

Professor, University of Nebraka

GENERAL

In spite of the occasional feeling of discouragement that overtakes the serious practitioner of the art of architecture when he sees the undue attention given by his confreres to some of the vagaries of the moment, there is no question but that the general level of the art in this country has reached a plane above that of any other country in the world. Perhaps there are not so many especially distinguished buildings going up today as a few years ago, but the general distinction of most of the work of consequence is very noteworthy. Chicago has held the lead for several years past, in the quality of its architecture, and the recent work of the firm of Holabird and Root, in that city, is on a very high and particularly distinguished plane. New York City, perhaps, builds more and bigger buildings, but Chicago designs—and builds—better architecture.

The increase, of late, in the number of European architects and architectural students who come to America to study, is a particularly significant thing. Ralph Walker, one of the most distinguished architects in America, upon his return from Europe recently remarked that "Europe has exalted the plumber, and the T-square and triangle are rampant. The right angle is the cross of the new European theory of architecture. The European architect is so engrossed with the two dimensions of Euclidean geometry and a theory of structure, that he has ceased to produce architecture for human beings . . . The modern architect should be much more a psychologist than an engineer, for the economies to be arrived at are human and not structural."

BUILDINGS

Industrial and Residential. — There seems to be so much more really good work this year, as we review, than there has been for a long time; it is difficult—and perhaps not quite fair—to endeavor to select examples by name. In general it is safe to point especially to the residential work of the architects of Southern California, the commercial work of Holabird and Root in Chicago, and the great multitude of telephone buildings by Voorhees, Gmelin and Walker.

Churches.—The new Plymouth Church, in Lincoln, Neb., by Harold Van Buren Magonigle, is excellent. This building has sounded an entirely new note in religious architecture and is particularly worthy of note in this country where so many churches are built each year, most of them so perfectly "awful" in an architectural way. This one is new, with a sufficient echo of tradition about it, so that it fits into its surroundings and fits the mood of the observer the while it admits frankly the very natural and very commendable desire of the age to be original.

EDUCATION

The Colleges and Universities.—Changes in architectural education—much as they are hoped for—are slow and far between. Most of the schools still carry through the insufficient four-year courses inherited from the Victorian period. A few—notably Harvard, Pennsylvania, Yale, Columbia, Princeton and Oregon—have more adequate courses of five or six years for the bachelor's degree. The University of Nebraska has just organized a new Department of Architecture and is offering a five-year course leading to the degree of Bachelor of the Art of Architecture—a new course with a new degree. The first two years of this course are spent in developing cultural backgrounds and the last three years are devoted to cultivating the Arts of Design with principal emphasis upon the "Mistress Art" of Architecture. Graduate work is offered in this new school also, leading to the new degree of Master of the Art of Architecture, but this graduate work is open only to holders of a bachelor's degree in architecture who have completed two years of actual work in the practice of architecture or three years in teaching since their original graduation.

Modern Expression.—Most of the schools are giving far more encouragement than it is wise—or safe—to give, to the exaggerated "Modern" expressions that reflect the European experiments referred to in the first section of this review. And so little attention is being paid to backgrounds in many of the schools, that one fears for the future of the young men who are passing through those particular schools at this time. Of course the principal difficulty with the whole educational scheme is that it is, necessarily perhaps, handled by men who are so young in years and experience that their judgment is not sound nor their taste sure. And the "Modern" experiment is a very tempting one indeed—particularly to youth.

PUBLICATIONS

Journals.—The magazine *Architecture*, published by Scribner's and edited by Henry Saylor, is easily the leader in the field of periodicals since the Institute saw fit to abandon its own very distinguished publication *The Journal*, in order to devote its funds to more spectacular uses.

Books.—The recent "popular" edition of the *Sculpture and Sculptors of the Greeks*, by Gisela M. A. Richter (Yale University Press) should be of great interest to architects, presenting as it does, the development of Greek sculpture in a most interesting and thorough manner. To those who still recognize our everlasting debt to Greece, *The Greek Way* by Edith Hamilton, is of particular interest and of great value. Although it appeared several years ago, *Architectural Composition*, by N. C. Curtis (J. H. Jansen, Cleveland) is far and away the best book available in English on Composition. The large book by Church and Hoak on *Masterpieces of American Architecture* (Scribner's) is particularly fine and will be of great interest to all American architects. Most of the recent books on architecture deal particularly with the temporary (one hopes) "Modern" expression and are very dangerous things—even to look at. Very little American architecture appears in their pages, as America, with all its artistic "faults," has not become sufficiently "Modern" to qualify for a prominent place in those weird books.

MUSIC AND THE OPERA

By Catherine Smith Bailey
Music Reviewer, *Christian Science Monitor*

ORCHESTRA

Philharmonic.—The orchestral world witnessed several interesting events during 1930. The Philharmonic-Symphony of New York engaged public attention throughout its season due in part to the activities of Arturo Toscanini of Milan, present conductor of the band. Mr. Toscanini's flair for attracting publicity, his dynamic personality and the activity of his followers in New York City have all combined to place him in the news columns almost constantly. During the summer he took the Philharmonic to Europe, touring with it the principal cities of England and the Continent. While there, the orchestra and especially the conductor received the most enthusiastic acclaim. The programs given in Europe consisted almost entirely of European music, and some American critics have ventured the suggestion that transporting an orchestra consisting almost entirely of European trained musicians with a repertory almost completely European was a questionable procedure. But at least the voyage did give an exhibition of the American talent for organization and for action and it has paved the way for similar excursions of equally skilled orchestras. As though he still were in need of public notice, Mr. Toscanini on his return to this country in the autumn exchanged podiums with Mr. Stokowski of the Philadelphia Orchestra. This swapping stunt did not prove the amazing success its inaugurators apparently had expected it would be. W. J. Henderson, speaking his mind frankly in the New York Sun, said, "One is impelled to declare that the game of exchanging conductors, recently played by Philadelphia and New York, was nothing better than a clumsy and undignified publicity feat." The first six weeks of the Philharmonic season were given over to Erich Kleiber, general director of the State Opera in Berlin, who managed to interest both public and reviewers in the programs he chose rather than in himself. A departure from New York's present mood of conductor worship.

The Manhattan Symphony Orchestra under the leadership of Henry Hadley has given a series of concerts which attracted a steady audience of moderate size. Each program contained at least one composition of American origin, and this in itself has given the orchestra a certain place in musical annals.

The Boston Symphony Orchestra, celebrating its fiftieth anniversary, launched a series of programs of unusual distinction. The outstanding composers of the day were commissioned to produce pieces for the 1930-1931 season. For the opening concert, the management of the orchestra were able to secure Sir George Henschel who, fifty years before, had conducted the first concert of the orchestra as organized by Henry Lee Higginson. With a single exception, Henschel conducted the identical program heard so many years ago. Among the more important works dedicated to the orchestra in its jubilee year are Stravinsky's "Symphonie des Peaumes," symphonies by Roussell, Honegger, Prokofieff and Hill, a Piano Concerto by Arnold Bax, and shorter pieces by Ravel, Dukas, Hindemith and Sibelius. An Ode by Hill and works by the Russians, Lourie, Naboukoff, and Trebinsky, round out the list. One of the most striking pieces performed was the "Little Symphony" by Krenek, which was not an anniversary piece. During the summer season, following the close of the Pops Concerts, given by the Boston Symphony Orchestra under the new leadership of Arthur Fiedler, a series of Esplanade Concerts were launched.

The People's Symphony Orchestra, under the new leadership of Thompson Stone, embarked on a series of concerts which started auspiciously. These, too, were conducted by Mr.

Fiedler, who is emerging as one of the more gifted younger American conductors. His years of experience with the Boston orchestra where he has been a member of the viola group and where he has also played the celesta now stand him in good stead, and his musicianship and authoritativeness are worth mention.

The Philadelphia Orchestra also observed an anniversary this year, since it marked its thirtieth birthday. The program book of the orchestra recalled succinctly the beginnings of the orchestra which go back to the summer concerts in Woodside Park where the German Orchestra led by Fritz Scheel played to outdoor audiences. In the season of 1900-1901 came a series of six concerts at the Academy of Music. From that time, an annual series of concerts has been given by the orchestra. Since 1921, when Leopold Stokowski came as conductor, the orchestra has increased in prestige until it now ranks with the Philharmonic-Symphony of New York and the Boston Symphony Orchetsra in the top rank of orchestras throughout the world. Mr. Stokowski's brilliance as a conductor and his aptness in catching the eye as well as the ear of his public has made him extremely popular. Some of his experiments have been eminently successful, but his rotation of the first violinists from week to week in the chair of the concert master, which he initiated during the past season, certainly could not be listed a success, since more than one proved ill at ease and without the qualities of leadership. But the season which otherwise stands to the credit of conductor and orchestra was a brilliant one, full of many noteworthy achievements.

Chicago.—In Chicago both orchestra and conductor followed sane, steady, yet constantly progressive courses. Frederick Stock, the conductor of the Chicago Symphony Orchestra, managed as always to hold his men in a path lined with the best of the classics and ornamented with a generous decoration of contemporary pieces.

Cleveland.—Nikolai Sokolov, still holding the reins of the Cleveland Symphony Orchestra and continuing to guide it skilfully through a consistently successful career, captured two of the outstanding novelties of the year when he presented Lazar's "The Ring: Music for Orchestra," and at a later concert the piece which created the greatest stir in September at Liege at the year's meeting of the Socity for Contemporary Music, A. Moslov's "Factory; Music for Machines."

Cincinnati.—Fritz Reiner and the Cincinnati Symphony Orchestra gave the first performance of Daniel Gregory Mason's Symphony No. 2 in A major in November. Mr. Reiner continued to pursue his policy of well balanced, neatly assembled programs, and his large audiences continued to attend.

Detroit.—Ossip Gabrilowitsch remained as conductor of the Dertoit Symphony Orchestra through half its season. The balance of the time guest, conductors wield the baton. Detroit still maintained its high civic leadership with its well managed Children's Concerts, conducted by Victor Kolar and managed by Edith Rhetts.

Pacific Coast.—In Seattle, Walter Krueger held sway; San Francisco's players were led during the first part of the year by Rudolf Hertz, in the latter part by Arthur Radzinski, formerly assistant to Stokowski in Philadelphia, where he displayed much initiative in operatic presentations with local companies. Basil Cameron has been engaged at Los Angeles.

OPERA

Chicago continues to possess one of the two first rate opera companies in the country, for the Civic Opera Company of the city, sponsored and supported by the wealthy and civically inclined is now established in its magnificent new home and continues to flourish. If novelties are not as plentiful in its lists as they are in the Metropolitan in New York, the well maintained standard of excellence which prevails throughout all the repertory is a considerable compensation. Yet novelties are not lacking, since during the year the company has mounted excellent performances of Beethoven's "Fidelio," Smetana's "Bartered Bride," Massenet's "La Navarraise," Bellini's "Norma" and Verdi's "Othello," some of which were revivals, but many of them have not before had place in the Chicago repertory. The company, rejoicing in one of the most remarkable aggregations of Teutonic artists which has at any time been gathered in America, presented a performance of Wagner's "Die Meistersinger von Nurnberg" with Egon Pollak conducting which reviewers acclaimed as one of the finest performances of this opera ever presented in this country. The Chicago Company continued its established practice of an extended tour at the close of the regular season. As though opera in the winter were not enough, Chicago also has a summer season of opera at Ravinia Park where, under the direction of Luois Eckstein, a company of good abilities dispenses excellent musical entertainment.

New York.—The more notable additions to the repertory of the Metropolitan Opera Company were a performance of Wagner's "The Flying Dutchman" revived on Nov. 10, with Maria Jeritza in the leading role of Senta and Artur Bodanzky conducting and Moussorgsky's "The Fair at Sorochintzy," the latter a folk opera of little pretentiousness and a modicum of pleasantry and charm. It was produced Nov. 29, and directed by Tulio Serafin. Jeritza's work in the early Wagnerian opera brought to her another great New York success, since she extricated from the trying and elusive role a splendid and a brilliant interpretation. Ivan Andresen, basso, and Georges Thill, tenor, added to the company during the year, were the outstanding new members. What amounted to a Wagner festival—and a very successful one—was brought to pass by the Metropolitan company in February and March when the entire cycle of the "Ring" as well as "Tristan und Isolde" and "Die Meistersinger" were performed under the authoritative and sure leadership of Artur Bodanzky. Perhaps the outstanding figures in the whole series of operas were the Siegfried, played by Mr. Laubenthal, Mme. Kappel's magnificent Brunnhilde (in "Gotterdaemerung") and Mr. Schorr's Wotan (in "Walkure.") In April New York was treated to an amusing modern version of Sophocles' "Antigone" by Jean Cocteau with musical settings by Arthur Honegger. These choruses, of much genuine beauty, were held to be a redeeming rather than a subsidiary feature.

BALLETS

Philadelphia.—The attention focused on the American premiéres of Schönberg's "Die Glückliche Hand." and Stravinsky's "Le Sacre du Printemps" can hardly be exaggerated. They occurred in Philadelphia on April 11, and were listed as one of the regular series of concerts by the Philadelphia Symphony Orchestra. Conducted by Leopold Stokowski, these ballets had distinguished preparation and casts. The orchestral part of the performance was beyond criticism, for the most part. Stravinsky's work, the music of which is thrice familiar to most American listeners, seemed much clarified when presented with the accompanying miming. Leonid Massine had prepared a new choreography for these performances (the program was repeated in Philadelphia and in New York); Nicholas Roerich designed new settings and costumes; and Martha Graham was the principal dancer. In the "Glückliche Hand" the chorus of 12 was splendidly prepared by Sylvan Levin, Ivan Ivantozff was the Man, Olin Howland the Chimera, Doris Humphrey the Woman, and Charles Weidman the Stranger. If these performances, given by Stokowski and the Philadelphia Orchestra in coöperation with the League of Composers of New York, revealed some deficiencies to members of the audiences, they did nevertheless achieve much musically and artistically.

FESTIVALS

Chicago.—Mrs. Elizabeth Sprague Coolidge sponsored a Festival of Chamber Music at Chicago Oct. 12 to 16. The opening concert was given over to Bach and Hindemith, when a sonatina in canon form for two flutes, "Die Serenaden" (a cantata for soprano, viola, violincello and oboe) and a new Konzert-Musik for piano, brass instruments and harp were heard as the modernist's contributions. Later programs listed Bax's Legend for piano and viola, Bridge's Trio for piano, violin and violincello, Szanto's "Choreographic Suite," Malipiero's "Ritrovari," Pilati's "Sonata" for flute and piano, sonata by Strube and Kricka, a Partita for violin and piano by Loeffler, Roussel's Trio for flute, viola and cello, Salzedo's "Preambule et Jeux," a Quintet by Frederick Stock, and a Concerto for Strings quartet and orchestra by Beck. Performers at these distinguished concerts included the Chicago Symphony Orchestra, the Gordon Quartet, the Brosa Quartet, Hariet Cohen, distinguished English pianist; George Barrere, flutist; Olga Averino, soprano; Iwan d'Archambeau, violincellist; Hugo Kortschak, who conducted a chamber orchestra, and Mme. Lübbecke-Job, pianist.

Bethlehem.—The annual Bach Festival in Bethlehem offered performances of ten church cantatas of Bach, all presumably having a first performance at these concerts, of which there were two this year. Mr. Wolle, the leader of the festival, provided texts for eight of the cantatas which had never been published.

Boston.—In March, Serge Koussevitzky and the Boston Symphony Orchestra, aided by such musicians as Arthur Schnabel, pianist; Margaret Matzenauer, contralto; the Burgin String Quartet and choruses from the Harvard Glee Club and the Radcliffe Choral Society presented a Brahms Festival which achieved tremendous success. The programs included the symphonies, the two piano concertos, the "German Requiem," the "Song of Destinay," some of the Liebeslieder Waltzes, the "Academic Festival" Overture, the piano Quintet, some songs and the piano pieces of opus 119. In November the Boston Symphony Orchestra repeated its Beethoven Festival of 1928 in Washington, D. C.

Worcester.—The Worcester County (Massachusetts) Musical Association held its seventy-first festival Oct. 1 to 4. Albert Stoessel again conducted orchestra and choruses. This year no novelties were presented, but the programs were all well constructed and held much worthwhile interest.

CHORUSES

Probably the outstanding novelty of the year came with the group of singers called the Don Cossacks. This organization has had, even for a Russian chorus, an interesting history. The group consists of 36 Cossack soldiers and officers who fought in the war, and who, at its end, found themselves prisoners in a camp near Constantinople. They organized a chorus, have sung in the Russian church in Sofia in Bulgaria, and have been traveling widely in the last five years. Their costumes, their singing, and their conductor, Serge Jarov, are all unusual. Quasi-orchestral effects are often heard, and the choir have a magnificent range of dynamics. Choruses continue to show much activity throughout the country, manifesting, perhaps, the soundest indication of a growing appreciation of music in this country.

PIANO NOVELTIES

Two interesting novelties in piano construction were presented during the year. Both had two keyboards, one above the other. Hans Barth, the inventor of one of these instruments, has evolved a quarter-tone piano. The Bechstein-Moor double-keyboard. piano was tuned so that there was an octave between each keyboard. Experiments and therefore decidedly intriguing, both these instruments, but to play either one, a pianist must Experiments and therefore decidedly intriguing, both these instruments, but to play either one, a pianist must acquire a nearly new technique.

SOLOISTS

Paderewski.—Across a not too lucrative horizon—for the concert world which had already received a tremendous blow from radio has also had to bear its share of the brunt of the current financial depression—the fabulous figure of Paderewski, still the greatest of living pianists, flashed. Crowded houses heard him. His technique which years of dabbling in politics had dimmed was notably refurbished and renewed. The old artistry was displayed to the thousands who sought him. Without question, Paderewski was the outstanding figure of the year, yet other concert performers of genuine merit must not be overlooked.

Other Concert Figures.—Iturbi, Gieseking, Myra Hess for pianists; Menuhin, the youthful violinist who still wins enthusiasm from the most cynical critics; Crooks, American and Wilson, English, tenor; Werrenrath; for hardy perennial the even-now-to-be-heard Schumann-Heink; and dozens of others who still maintain a prominent and commendable place in recital annals. But there is no denying the diminishing public for the mediocre recitalist, the hopeful debutantes of music who cluttered up the concert hall stages before the radio absorbed so many of them into its own proving ground. A far more serious situation exists among those men and women who for years made the performance of music their livelihood, in theaters, in moving picture orchestras, at the organs in the movies, in all the fields of entertainment which the talkie now has encroached upon and made its irrevocable own. The petitions drawn up throughout the country and signed by hundreds of thousands, urging the disposal of this "canned music" from Hollywood and the substitution of the actual musician in its place, does little more than bespeak the present difficulty among these players.

RECORDED MUSIC

A constantly growing field of worthwhile musical endeavor is found in the record music of the various commercial companies. Victor, Columbia, Brunswick, Edison, and all the others including the foreign makers now compete for the constantly growing demand for better music. With the spread of musical appreciation courses to nearly every secondary school and college, there is an increasing call for records of good orchestral and chamber music. Individuals, too, make collections of symphonies, string quartets, and music for chamber orchestras. Modern music as well as that of the masters is much in demand. A few samples of the year's output indicate the caliber of present production. From the Boston Symphony Orchestra came a magnificent reading of Chaikovsky's Symphony in B minor, No. 6, the Pathetic, and Ravel's great success of the year "Bolero"; the Philadelphia Orchestra turned out a stirring interpretation of Brahm's Symphony No. 2 in D major; The Philharmonic Symphony of New York, led by Mengelberg, recorded Mozart's "Magic Flute" Overture; the Chicago Symphony Orchestra did a performance of Schumann's First Symphony in B flat. Among the more outstanding recordings by soloists were Yehudi Menuhin's playing of Bach's Sonata in C major; Adolf Busch's disks of the Bach Sonata in D minor; Paderewski's playing of Debussy's "Minstrels" and "Wind in the Plain"; Godowsky's masterly interpreptation of Beethoven's E flat major sonata; records by Brailowsky, Ganz, Alexander Kipnis and many others. Magnificent recordings of chamber music became available, but these were in large part foreign recordings, although they were sold here. These included performances by the Brosa, the Lener, the Budapest, the London and the Guarneri string quartets. The Flonzaleys, that magnificent group of string players who for twenty-five years unfolded string quartet music of the rarest quality to Americans have fortunately made some disks which can preserve to later listeners their incomparable excellences and may recall vividly to those who regret their disbanding their charm and persuasiveness.

THE THEATRE

By J. Brooks Atkinson

Dramatic Critic, *The New York Times*

TICKET SPECULATION MOVEMENT

Some attempt was made by the managers to remedy the evil of theatre-ticket speculation. Towards the close of the year the New York Theatre League, which was an association of managers and accredited ticket brokers, was still a strong factor in the distribution of tickets; but there were still two or three important managers who had not joined, there were still rumors of defection from time to time and there were still unaccredited brokers who got hold of tickets and sold them at high prices. The Theatre League members agreed in the first place to leave a certain number of the desirable tickets in every theatre on sale at the box office where the public could buy them. The accredited brokers agreed in the second place not to charge more than 75 cents for their service to customers. Finally an arrangement was made with the Postal Telegraph Company to sell tickets on telegraph order for a delivery charge of 50 cents. All these agreements were entered into in the hope of attracting the public back to the box office and improving the reputation of the theatre as a business organization. But with Mr. Ziegfeld and Jed Harris remaining out of the League and Mr. Belasco struggling to resign and the brokers grumbling and threatening to break away, it was still impossible at the end of the year to make sure that the Theatre League would accomplish what it wanted to do.

NOTABLE PLAYS

"The Green Pastures."—The most notable play of the year and one of the most notable plays in American drama, was "The Green Pastures" by Marc Connelly, produced in New York Feb. 26. Taking his suggestion from Roark Bradford's volume of burlesque Negro sketches, *Ol' Man Adam and His Chillun*, Mr. Connelly retold a series of Bible stories in terms of a Negro miracle play. It was a combination of fantasy, folk comedy, religion and speculation. It included scenes laid in Heaven, The Garden of Eden, and Egypt. Among its characters were Adam and Eve, Moses, Joshua, Noah, the Angel Gabriel and the Lord. Extraordinary imaginative scenery had been designed by Robert Edmond Jones; and while the sets were being changed the Hall Johnson choir of Negro singers sang appropriate spirituals from the wings. The actors were all Negroes; William B. Harrison, who played the crucial role of the Lord, had a sweetness, kindliness and simplicity about him that were marvelously beautiful in the theatre. Although the terms of the Pulitzer Prize award seemed to indicate that no play made from a book could be eligible, the judges rose to the occasion and gave the prize to "The Green Pastures."

"The Last Mile."—Although the year was not a brilliant one in the theatre it included several other plays that were notable. John Wexley's "The Last Mile," a play of prison life in the death house, created a profound impression when it was produced in February and was one of the plays considered for the Pulitzer Prize. The first act of "The Last Mile," chronicling in realistic terms the last hours before a prisoner's execution in the electric chair, was drawn almost literally from a sketch written by a condemned man and published the year before in the *American Mercury*. The last two acts were a fairly literal transcription of the events in one of the recent prison mutinies. Staged brilliantly by Chester Erskin and produced by Herman Shumlin, both of whom immediately became men to reckon with in the theatre, "The Last Mile" was one of the events of the year.

"Grand Hotel."—Another event was also a production by Herman Shumlin, "Grand Hotel" by Vicki Baum, produced in November. Originally "Grand Hotel" was a novel by Frau Baum in German; then she turned it into a play which was produced in Berlin by Max Reinhardt; the American version came next. Selecting several interesting and significant guests from the many assembled in a metropolitan hotel in Berlin, "Grand Hotel" skipped from one room to another in eighteen episodic scenes and gradually wove the various characters into a crucial story. Brilliantly directed and acted, it was sound theatre. Beyond that it was a sort of microcosm of metropolitan life. These characters represented cosmopolites generally. The cast included Eugenie Leontovitch as a famous dancer. Madame Leontovitch, a Russian, had been appearing in this country for some time, but her sensitive acting in "Grand Hotel" was the first distinquished work she had had the opportunity of doing in New York.

"Uncle Vanya." — After living abroad for a year or more, Jed Harris, whose first successes as a producer were sensational, returned to New York late in the Spring and produced Chekhov's "Uncle Vanya" in a new version by Rose Caylor. Although the play was hardly of a popular nature, the vivacity of the adaptation and the perfection of a cast including, Lillian Gish, Osgood Perkins, Walter Connelly and Joanna Roos, gave it a moderate success in New York and a creditable career on the road.

"Mr. Gilhooley."—Excepting a version of "The Inspector General," which had not reached the stage when these lines were being written, Mr. Harris's only other production was a dramatization of Liam Flaherty's novel, "Mr. Gilhooley." The dramatization was a barren one, capturing little of the novel's spirit, and the production was a failure. But the acting of Arthur Sinclair, the Abbey Theatre graduate, in the leading role, was memorable, and Helen Hayes, in the second part, played with great charm and dexterity. Many discerning theatregoers mourned the failure of "Mr. Gilhooley," and blamed it on the obtuseness of the public.

SATIRE IN THE THEATRE

"Once In a Lifetime."—For satire the year had nothing to compare with "Once In a Lifetime," by George S. Kaufman and Moss Hart. It was a lampoon of Hollywood, indecorously exposing the confusion, ignorance and hollow grandeur of that golden metropolis. It was charged with stinging wit, acted at high pace and brilliantly directed by Mr. Kaufman, who also played one of the roles. The story followed the satire pattern of "June Moon" and "The Butter and Egg Man." The wit was maliciously adroit and explosive, and "Once In a Lifetime" speedily became the most popular of the autumn successes.

"Oh Promise Me."—Only two months after "Once In a Lifetime" put in its appearance, Howard Lindsay and Bertrand Robinson applied the same point of view to the breach-of-promise racket in a satire, "Oh Promise Me." In three acts it disclosed the skill with which an unscrupulous attorney framed a millionaire in a breach-of-promise suit and won the case in court by the most flamboyant sort of trickery. Lee Tracy played the part of the corrupt attorney. Although "Oh Promise Me" lacked wit and subtlety it was funny and tumbling, and it found a public immediately.

"Topaze."—Another excellent satire popular last year was "Topaze," translated from the French of Marcel Pagnol. With a light, dry cynical touch it showed how a simple-minded rural school teacher, who believed in all the maxims about honesty and success, was corrupted by the chicaneries of French petty officialdom and finally changed into a first-rate grafter himself. The leading part was one of Frank Morgan's best character portraits, and M. Pagnol had written with a capitally amusing sense of mischief. "Topaze" was popular in New York and most of the cities of the East.

"Children of Darkness." — There were several variously interesting plays by the younger writers for the stage. Edwin Justin Mayer went to the Jonathan Wilde legends for the material of "Children of Darkness," a satiric *tour de force* laid in Newgate. Although the play lacked the spring and bounce of drama, it was extremely well written in an artificial eighteenth century style, the ideas were mordantly amusing and the acting by Mary Ellis, Basil Sydney and Walter Kingsford was expert. "Children of Darkness" was less than successful as a commercial venture, and it failed very quickly in London in the autumn, but it had many delighted admirers.

PLAYS OF CONTEMPORARY LIFE

"Rebound."—Contemporary American life was represented in such dramas as Donald Ogden Stewart's "Rebound," Kenyon Nicholson's "Torch Song" and Robert E. Sherwood's "This Is New York." Mr. Stewart, known best for his parodies and humorous sketches in book form, had acted the season before in a comedy by Philip Barry. "Rebound" was a comedy of his own in a similar vein; the chief part was taken by Hope Williams and Mr. Stewart played a minor role himself. "Rebound" was the story of blighted love in the modern idiom. How the wrong people marry in confusion and repent almost immediately, and abandon everything except their gallantry, was told by Mr. Stewart in an enjoyable fashion, though without much strength of theatrical construction.

"Torch Song."—Kenyon Nicholson's "Torch Song" was a dramatic comedy of life in the small towns on the Middle West. In the first act an attractive young travelling salesman deserted a cabaret singer to marry his boss's daughter. Much broken up over his treachery, the cabaret singer joined the Salvation Army. She stumbled across her former lover by chance one Saturday evening in a shabby provincial hotel. The rest of Mr. Nicholson's play disclosed the similarity between physical passion and hysterical evangelism. Although "Torch Song" was rather frail as a play and hardly original in its theme, the dialogue was well written and the characters pleasantly imagined.

"This Is New York."—Early in the year Robert E. Sherwood was represented by a desultory, sentimental play about a prostitute in London,—"Waterloo Bridge" in which June Walker and Glenn Hunter appeared. In December he turned up with a genuine comedy entitled "This Is New York." Although it still showed Mr. Sherwood's weakness as a builder of plays, it had a spontaneous sense of humor, an enlightened point of view and a collection of very interesting local characters. The story brought together a pompous Northwestern Senator who thought New York represented the moral depravity of the United States and a group of depraved New Yorkers who showed that they had quite as much to recommend them as the Senator had to recommend him. Without writing a thesis Mr. Sherwood managed to defend New York sensibly and amusingly.

COMEDY AND FARCE

Among the more popular light plays of the year were Frank Craven's middle-western folk comedy, "That's Gratitude," in which he appeared; Paul Osborn's brisk farce, "The Vinegar Tree," in which Mary Boland appeared as a modern Mrs. Malaprop; Edgar Wallace's play of the Chicago racketeer, "On the Spot," which may have been intended as melodrama but to most theatregoers seemed like civilized comedy; and H. M. Harwood's "The Man in Possession," one of the few importations from England that attracted New York audiences.

THEATRE GUILD

"The Apple Cart."—The Theatre Guild fortunes were mixed and sometimes vexing, but the second half of the year represented the Guild in its proper form. In February the Guild mounted Bernard Shaw's "The Apple Cart," a bad play but a Shavianism. It was a half serious speculation on the nature of Parliamentary government some years in the future. It contained bits of Mr. Shaw's most brilliant, objective writing, but it was hardly more than reminiscent of Mr. Shaw at his best, and it enjoyed only a moderate run in New York.

"Hotel Universe."—In March the

Guild made a very beautiful production of Turgenev's "A Month in the Country," which seemed like pale Chekhov and of no more than academic interest. In April the Guild mounted Philip Barry's seriously experimental drama, "Hotel Universe," which split the world into two camps. It was a Semi-expressionistic study of the modern distemper as illustrated in a group of well-heeled young Americans living in a small village in France. It had tags of philosophy, religion, psychology and spiraling comedy. Some people were honestly impressed. To others it was Mr. Barry beyond his depth.

"Roar China!"—In the autumn the Guild mounted two excellent pieces within a week of each other,—"Roar China!" and "Elezabeth the Queen." "Roar China" was an adaptation of S. Tretiakov's Soviet drama about the rapacity of the English and the Americans in China. What made it so interesting, however, was not the propagandist story but the ambitious, free-handed production the Guild gave it with an enormous setting by Lee Simonson representing a battleship that seemed to float in real water and that moved fiercely downstage in battle formation as the climax of the play.

"Elizabeth the Queen."—Maxwell Anderson's "Elizabeth the Queen" was a freely improvised story of Elizabeth's love for Lord Essex, altering the facts of history to suit its psychological purpose. Written in a combination of prose and poetry that was as lucid and forceful as Mr. Anderson's thinking, "Elizabeth the Queen" was an earnest of the Guild's best work in production. Lynn Fontanne's portrait of Elizabeth was the finest creative acting of the season, and Alfred Lunt's Essex, which was an inferior part, was also admirable and tangible. Those who had been disgruntled by the Guild's lack of progress in the preceding season began to think that it was again on its true course, choosing plays as intelligently as it always mounted them.

SHAKESPEARE

Shakespeare was not so much neglected as he had been for several years. In the spring Fritz Leiber as head of the Chicago Civic Shakespeare Society, gave a three weeks engagement that included several of the favorite plays. Eva Le Gallienne appeared as Juliet in "Romeo and Juliet" at the Civic Repertory Theatre in Fourteenth Street. It was a first-rate bit of classical acting in an uneven production. Jane Cowl and Leon Quartermaino put on "Twelfth Night" in the autumn; it was the best Shakespeare New York had seen for a long time. Maurice Moscovitch held a brief engagement as Shylock in "The Merchant of Venice" towards the end of the year. His acting was too mild and amiable to make much of an impression.

MUSICAL PLAYS

There were many excellent musical plays;—"Fine and Dandy" with Joe Cook; "Simple Simon" with Ed Wynn; "Ripples" with Fred Stone; "Smiles" with Marilyn Miller and Fred and Adele Astaire; "The New Yorkers" with Clayton, Jackson and Durante, Hope Williams, Frances Williams, Charles King and Ann Pennington; and "Three's a Crowd" with Fred Allen, Libby Holman and Clifton Webb. As usual the musical stage was more competently managed and directed than the dramatic.

MISCELLANEOUS

"Lysistrata."—Of the odd things that turn up every year the revival of "Lysistrata" by Aristophanes was certainly the most spectacular. Adapted by Gilbert Seldes and mounted by Norman Bel-Geddes it appeared first for four or five weeks in Philadelphia under private auspices, and then moved to New York where it was still visible at the end of the year.

"Chinese and Japanese Offerings."—Mei Lan-Fang, "Foremost of the Pear Orchard," and the finest contemporary Chinese actor, appeared for a few weeks in a repertory of truncated Chinese plays. The complete, exotic unreality of the plays and the acting, and the superb grace of Mr. Mei's playing aroused considerable interest. A few weeks later a troupe of Japanese actors, headed by Tsutsui, appeared in native dances and dramas, but less successfully. Probably the novelty of Oriental acting had been satisfied by Mei Lan-Fang.

MOTION PICTURES

By Mordaunt Hall

Motion Picture Critic, *The New York Times*

GENERAL PROGRESS

Quality.—Due largely to the exacting demands of the audible screen there was in 1930 a far greater percentage of intelligent motion pictures than in any previous year and while it is true that film-makers leaned too heavily on the stage for their stories, such pictorial adaptations often possessed a praiseworthy cinematic quality combined with a higher order of acting than was to be found in the old silent offerings. Aside from the pictorial translations of plays there were quite a number of cinema works based on novels and a few that were made from tales written especially for this form of entertainment. Although there were many more intelligent pictures than in other years, producers still made a preponderance of fatuous efforts, which included extravagant and amateurish stories of modern youth, comedies with backgrounds of prisons, inept romances and extravaganzas and cheap pictures inspired by successful ones. Producers of such effusions were guided by box-office receipts and, unfortunately, some of these unworthy contributions met with financial success.

Noiseless Recording.—Great strides were also made in the technical end of films. The voices were more life-like, and the theatre managers realized the value of modulating the utterances from the screen. To accomplish this improvement in tonal quality, sound experts waged a campaign among theatre managers all over the country and toward the close of the year a means to eliminate all undesirable surface noises was discovered by the Western Electric Company's subsidiary concern, the Electrical Research Products, Inc. This new system of recording was called "noiseless recording," and it was characterized as the greatest advance in talking pictures of the year. Its development was the result of several years' work on the part of sound engineers to eliminate what was technically known as "ground noises," which are those extraneous hissing and scratching sounds that often have marred audible films. Through the exclusion of these sounds, the voices and other sounds were infinitely more natural.

Synchronization.—The few instances of defective synchronization that occurred in the better class theatres were invariably caused by poor prints. In fact the vocal recording and reproduction, together with the work of good actors, resulted in quite a number of pictures being so convincing that one forgot that the story was being unfurled through the talking of mere shadows.

Special Screen Vehicles.—An excellent example of a special screen narrative was Frederick Lonsdale's "The Devil to Pay," in which Ronald Colman played the leading role. Through the scope of the screen and the camera one had the opportunity of following the characters in this film from Africa to England and from London to Epsom Downs. It was a picture that was so sufficient that one did not wish to see the players in the flesh and neither did one want depth or color. This revealed that even with light comedy such as was Mr. Lonsdale's contribution, a specially written screen vehicle helps considerably in creating a highly satisfactory illusion.

FILM ADAPTATIONS FROM BOOKS

"Tom Sawyer."—Of the many excellent examples of pictures produced from books was that made of Mark Twain's immortal story of boyhood, *The Adventures of Tom Sawyer,* in which not a few of the scenes virtually come to the screen as one had mentally pictured them while reading the story.

"The Old Lady Shows Her Medals."—Producers also succeeded in making a worth-while film of Sir James M. Barrie's playlet, "The Old Lady Shows Her Medals," and, while several scenes were written into the picture, those responsible for this amplification succeeded admirably in keeping to the spirit of the original work.

"A Double-dyed Deceiver."—An important film into which a romance was woven by studio writers was the adaptation of O. Henry's short story, "A Double-dyed Deceiver," which sustained the interest to the closing episode, and those scenes which were done in the spirit of the parent tale.

"All Quiet On the Western Front."—Still another splendid adaptation from a novel was the film of Erich Maria Remarque's enormously popular book, *All Quiet On the Western Front,* which possessed the merit of standing the test of having read the book just before witnessing the picture, an acid test for any cinema work. Although Lewis Milestone did well by the direction of this production, much of the credit for its superiority was due to the careful and intelligent adaptation of Maxwell Anderson and George Abbott, experienced playwrights.

CHAPLIN'S SILENT PICTURE

There were, however, certain producers who thought that Chaplin's new comedy, "City Lights," which is to be released in February, 1931, and which has no dialogue although it is equipped with a synchronized music score and a few songs, would result in a demand for more silent films. And it was their opinion that quite a number of mute productions would follow on the heels of the Chaplin work, which, because the comedian has not been seen in any new film for nearly three years, was virtually assured of a huge financial success. Anent this Chaplin feature, with subtitles in foreign tongues, it should be stated that it has a distinct advantage over audible productions in as much as it can be shown in many lands, which is not the case with an English dialogue picture.

EXPERIMENTS WITH FOREIGN-SPEAKING FILMS

"Dubbing" Voices.—As a matter of record, talking pictures in English, even when exhibited with explanatory subtitles between sequences, met with disapproval in most foreign-speaking countries, which meant that the foreign speaking market was lost to producers. This resulted in film makers endeavoring to produce foreign language audible pictures in German, French, Spanish and other tongues. One of the early methods was to "dub" voices, *i. e.,* having foreign speaking actors watch the picture in a projection room and speak their language lines into a microphone, making their speeches synchronize as nearly as possible with the lip movements of the players conversing in English. This, as one might presume, was not very successful, except in a few instances where the lip movements of an individual player were made to suit the foreign words.

A Venture in German.—One of the major film companies, eager to have a special production presented in Germany, decided to try a new method, which was quite ingenious. It was the idea of having the original American players learn the German lines and speak them as they went through the action of the picture. The voices were not recorded by a microphone but the lips of the actors moved to the foreign utterances and the expression and gestures lent vitality to the scenes. Then this silent film, with the lips of the participants moving to German dialogue, was screened before a special cast of well-rehearsed German players, who, while watching the lip movements of the players on the screen, spoke the German lines into a microphone. Although the results were fairly good in a number of sequences, there were often unfortunate periods when the voices slowed up unnaturally, evidently to keep time with the lip movements of the screen images. It was finally decided that the only way to make such foreign language productions was to employ a foreign cast to act in them, the chief economy being that some of the scenes in which there was no speaking could be used and also all the sets that had served for the English-speaking version.

Methods of Certain Comedians.—Comedians like Harold Lloyd, Buster Keaton and others, whose silent films had a wide circulation in foreign language countries, had their difficulties once they produced dialogue pictures. In the beginning they issued silent editions of their films for the foreign language market, but this did not prove to be either feasible or economical. Then, too, the foreign language countries wanted talking comedies in their own language. Unlike other producers, these comedians realized that there would be no great demand for their product with imitators in their roles. Messrs. Keaton and Lloyd eventually surmounted this obstacle by learning brief lines in German, Spanish or French, as the case might be, and surrounding themselves with foreign language players. It entailed the making of a new production, but as they could charge more for the rental of this film than they had for their mute pictures, this was not a serious handicap. Moreover, production was hastened by the using of the same stage sets that had seen service in the English editions.

FOREIGN PICTURES IN THE UNITED STATES

Germany.—While other countries showed improvement in their vocal films, they did not offer any serious competition to Hollywood. Germany sent over several audible productions, but the only examples of much consequence were an operetta, known as "*Zwei Herzen in Drei Viertel Takt.*" and "The Blue Angel," the latter having as its star Emil Jannings, whose broken English was accounted for by the crafty idea of having him impersonate a German professor of English literature in a German high school.

Russia.—The Soviet producers contented themselves by making silent films, some of which were extraordinarily good but their entertainment value was discounted by the inevitable hard-fisted propaganda. There were four outstanding Russian films. They were: "Turksib," a stirring account of the construction of the Turkestan-Siberian railway; Sergei Eisenstein's "Old and New," which dealt with the revolution in farming machinery in Russia; "China Express," which gave a Bolshevik conception of the downtrodden Chinese, and "Storm Over Asia," Soviet propaganda with a Mongol background.

France sent over a rather interesting films called, "*Sous les Toits de Paris,*" and, while it was an audible production, it was directed in such a way that, except for a gentle melody which ran through its scenes, it would have been all the better for having no dialogue.

Sweden. — Sweden's contribution was "*För Hennes Skull*" (For Her Sake"), which, while it was an unimportant and somewhat meandering effort, was at least blessed with a change of atmosphere, novel twists and pleasing simplicity.

MECHANICAL PROBLEMS

Film Width.—It was expected that 1930 would see many wide-film offerings, but the American producers decided to go slowly in making such productions, first, because they feared the result of mechanical and architectural changes in theatres demanded by the enlarged screen process here and abroad; second, because they did not come to any agreement on the standard width of the film. Several wide-film productions were made by different companies, the film width varying in each instance. Metro-Goldwyn-Mayer issued a picture for a wide screen with the present standard film width. It was said to have a special emulsion which permitted of magnification without the images being blurred. It had some effective panoramic views, but it was not by any means as impressive as the productions which were projected from a wide film. The Fox company issued a Grandeur spectacle, called "The Big Trail," which was presented at the Roxy on an enlarged screen. It was without a doubt far more effective than the ordinary size picture. So was the Warner Brothers' production, "Kismet," another of the wide-film offerings. It was agreed among the producers that only isolated examples of their respective wide-film processes would be launched, and that the producing of such enlarged pictures in any great numbers would be postponed until a more propitious time and when the studio chieftains had reached an agreement as to the standard width of such films.

FINANCIAL FACTORS

Production.—Early in the year the Fox Film Corporation was the center of an economic upheaval which resulted in a new financing arrangement, William Fox being superseded as president of the company by Harley L. Clark. Other producing concerns have fared badly through the Wall Street crash and the general depression, but considering what has happened to industries in general the motion picture producers and the theatres have held their own.

Theatre Receipts.—The receipts were a good deal lower than during the previous year for the ordinary program picture, but when a good popular film was exhibited in a New York theatre it often played to capacity. At the present writing pictures are being held over for a second week at the Roxy, the Capitol and the Paramount, which is in itself proof of the financial success of the attractions on exhibition.

PICTURE CIRCULATION

"Grumpy."—An interesting example of the wide circulation of a motion picture was furnished by the film of the play, "Grumpy." This picture suggested a comparison between a picture and a play because on the main title preceding the screen version it was set forth that Cyril Maude, who appeared in both the film and the stage work, had acted the title role before the footlights 1,300 times. If these performances had been consecutive—which they were not—they would have taken more than three years. There were 150 prints of the film. These were tantamount to 150 shadows of Mr. Maude going over the country accomplishing what would be impossible for a human being—giving from five to seven performances a day. It was estimated that nearly 150,000 performances were given in this country and Canada. Besides this staggering figure, the film had many showings in Great Britain, South Africa, Australia and New Zealand.

THEATRE ATTENDANCE

In view of the adverse criticism of talking pictures at the beginning of the year, despite the progress made over the previous twelve months, audible films have increased the attendance at cinemas in a most impressive fashion. In 1922 the average weekly attendance at motion picture theatres in the United States was 50,000,000. This figure mounted until 1927, when it was practically at a standstill. Talking pictures brought the attendance up to 95,000,000 in 1929 and last year it was estimated by the Motion Picture Producers and Distributors that 115,000,000 was the weekly attendance at film houses in this country. This would seem to mean that the talking film had won a vast new audience for the screen.

COGNATE SOCIETIES

GENERAL

American Academy in Rome, 101 Park Ave., New York City.

American Academy of Arts and Letters, 633 West 155th St., New York City.

American Ceramic Society, Lord Hall, Ohio State University, Columbus, O.

American Federation of Arts, The Barr Bldg., Farragut Sq., Washington, D. C.

American Fine Arts Society, 215 W. 57th St., New York City.
American Institute of Architects, 101 Park Ave., New York City.
American Numismatic Society, 156th St., and Broadway, New York City.
American Scenic and Historic Preservation Society, 154 Nassau St., New York City.
American Water Color Society, 215 W. 57th St., New York City.
Archaeological Institute of America, New York University, University Heights, New York City.
Architectural League of New York, 115 E. 40th St., New York City.
Art Alliance of America, 65 E. 56th St., New York City.
Art Center, Inc., 65 E. 56th St., New York City.
Artists Guild, 420 Lexington Ave., New York City.
Fine Arts of Federation of New York, 215 W. 57th St., New York City.
Graphic Arts Board of Trade, 291 Broadway, New York City.
Guild of Free Lance Artists, 420 Lexington Ave., New York City.
Hispanic Society of America (the), 156th St., West of Broadway, New York City.
Municipal Art Society of New York, 119 E. 19th St., New York City.
National Academy of Design, 175 W. 109th St., New York City.
National Assn. of Women Painters and Sculptors, 17 E. 62nd St., New York City.
National Institute of Arts and Letters, 633 W. 155th St., New York City.
National Sculpture Society, 115 E. 40th St., New York City.
New York Society of Architects, 25 W. 39th St., New York City.
New York Society of Craftsmen, 65 E. 56th St., New York City.
Society of Arts and Crafts, 721 Madison Ave., New York City.
Society of Beaux Arts Architects, 126 E. 75th St., New York City.
Society of Illustrators, Art Center Bldg., New York City.
Society of Independent Artists, Inc., 1947 Broadway, New York City.

DRAMA

Actors Equity Assn., 45 W. 47th St., New York City.
Actors Fidelity League, 11 E. 45th St., New York City.
Actors International Assn., 701 Seventh Ave., New York City.
American Dramatists, 2 E. 23rd St., New York City.
American Dramatists and Composers Society, 2 E. 23rd St., New York City.
Drama League of America, 59 E. Van Buren St., Chicago, Ill.
English Folk Dance Society, 159 E. 33rd St., New York City.
Episcopal Actors Guild, 1 E. 29th St., New York City.
International Theatrical Assn., 1540 Broadway, New York City.
Motion Picture Directors Assn., 234 W. 55th St., New York City.
Motion Picture Producers and Distributors of America, Inc., 469 Fifth Ave., New York City.
Motion Picture Theatre Owners of America, 1650 Broadway, New York City.
National Assn. of the Motion Picture Industry, Times Bldg., New York City.
National Board of Review of Motion Pictures, 70 Fifth Ave., New York City.
Photoplay League of America, 221 W. 57th St., New York City.
Theatre Guild, Inc., 243 W. 52nd St., New York City.

MUSIC

American Guild of Organists, 217 Broadway, New York City.
Cantors Assn. of America, 40 Second Ave., New York City.
Chorus Equity Assn. of America, 110 W. 47th St., New York City.
Grand Opera Society of New York, 939 Eighth Ave., New York City.
Jewish Federation for Music and Drama, Inc., 5 Beekman St., New York City.
League of Composers, Inc., 29 W. 47th St., New York City.
MacDowell Endowment Fund Assn., 1 E. 57th St., New York City.

Musical Alliance of the U. S., Inc., 501 Fifth Ave., New York City.

National Bureau for the Advancement of Music, 45 W. 45th St., New York City.

National Music League, 113 W. 57th St., New York City.

National Patriotic Song Committee, 62 Washington Square S., New York City.

New York Community Chorus, 113 W. 57th St., New York City.

Opera and Drama Society, 1730 Broadway, New York City.

Oratorio Society of New York, 113 W. 57th St., New York City.

People's Chorus of New York, 41 E. 42nd St., New York City.

Philharmonic Society of New York, 113 W. 57th St., New York City.

Russian Balalaika Orchestra Assn., 1560 Broadway, New York City.

Sunday Symphonic Society, 113 W. 57th St., New York City.

Symphony Society of New York, 33 W. 42nd St., New York City.

DIVISION XXVII

EDUCATION

ELEMENTARY EDUCATION

By Robert K. Speer

Professor, School of Education, New York University

STATISTICAL

It is estimated that there are over 20,000,000 school children in the elementary grades in the United States, and over 800,000 professional educators serving them. This number includes superintendents, principals, supervisors, as well as teachers. There are over 10,000,000 school children in open country schools served by approximately 400,000 rural school teachers.

OBJECTIVES IN ELEMENTARY EDUCATION

A study to determine "Cardinal Objectives in Elementary Education" undertaken by the Elementary Education division of the New York State Department of Education has received much favorable comment in the professional education group. The following statement of objectives was arrived at: "It is the function of the public elementary school to help every child: 1. To understand and practice desirable social relationships; 2. To discover and develop his own desirable individual aptitudes; 3. To cultivate the habit of critical thinking; 4. To appreciate and desire worthwhile leisure activities; 5. To gain command of the common integrating knowledge and skills; 6. To develop a sound body and normal mental attitudes."

SCHOOL DEVELOPMENTS

Special Services.—While not far advanced, there has been in recent years a tendency to introduce into school organizations special divisions servicing, along with other school units, the elementary sections. These include educational guidance workers, visiting teachers, school doctors, school dentists, school nurses, psychological clinicians, dieticians, etc.

Special Classes.—In the larger cities we now find special classes for atypical children — classes for the blind, sight-conservation classes, classes for the deaf, open-air classes, tubercular classes, classes for the crippled, cardiac classes, hospital classes, etc. While not all such classes are found in every city area, most cities are recognizing the need and have begun to establish such classes for some of the types. The studies of retardation of individuals gave rise in American educational systems to the establishment of special classes for the mental deviates. Nearly always these special classes were designed for the mental unfortunates. Now one notes a greater recognition of the need within the elementary school organization of special classes or treatment for the gifted children, especially the mentally gifted. Classes are being organized in the more densely populated areas for the mentally gifted. Paralleling this, the School of Education of New York University has established a Clinic for the Social Adjustment of the Gifted.

Individual Differences of Pupils.—An outstanding trend (over a period of two decades) in American elementary education is concern for the individual pupils. The various practices developed which definitely aim to meet individual needs of pupils follow: A. Adjusting to individual differences while retaining the class organization: (1) Coaching laggards—Batavia Plan; (2) Extra time for laggards; (3) Study of problem cases; (4) Ability grouping; (5) Differentiated assignments; (6)

Grouping within class according to subject ability; (7) Group-study plan; (8) Coöperative Group plan; (9) Guidance plans; (10) Adjustment rooms; B. Adjusting to individual differences with the class organization broken up: (1) Dalton Plan; (2) Winnetka Plan; (3) Oxford idea; C. New or progressive education plans which purport to consider individuals in a larger degree: (1) Fairhope Organic School; (2) Project plans; (3) Creative education; (4) "Schools that are propehecies" (as reported in the N. E. A. Journal now and again during 1929 and 1930); D. Plans for individualization of instruction in the small elementary school: (1) Individual assignments; (2) Problem-project methods; (3) Directed study; (4) Socialized recitation, etc.

Curriculum Adjustment.—One of the most significant movements in American education in this last few years has been the establishment of hundreds of committees in public school organizations throughout the United States whose responsibility it is to deal with the problem of curriculum adjustment. The result has been the development of many new courses of study supposedly liberalized and vitalized, and the elimination of a good deal of the material whose only claim to school time was on the basis of mental discipline. In this curriculum revision movement there has been a very definite tendency to organize more of the courses of study around suggested activities with the enumeration of related subject matter, and away from a listing of subject matter with occasional mention of suggested activities.

Subject Matter Trends.—There is a trend away from the treatment of subjects in a morphological and encyclopedic way toward a consideration of function and functioning with the result that there is less material, but a hope that this will be learned more potentially. In arithmetic the trend is away from extensive consideration of a very large body of subject matter to intensive consideration of established needs in a social life. In geography, history and civics the trend is away from differentiated courses (nearly always morphological and encyclopedic) and toward an integrated course in Social Science built around dynamic life themes and leading to social concepts and meanings. In physical education the trend, while not far advanced in practice, is away from formal group work and toward corrective work for individuals and organized free-play for class groups. In health it is still bookish, but there is a greater realization that health information does not guarantee healthful habits. In science the trend is away from a more or less sentimental presentation of nature study and toward a development of scientific concepts through a consideration of the natural phenomena, real and close at hand. In art the trend is away from almost total consideration, in art courses, of production or reproduction (that is drawing) of art objects to emphasis upon appreciation of art through the making of discriminatory judgments of things artistic (art specimens).

CHARACTER EDUCATION

Just as various themes such as socialized recitation, project method, directed study, and curriculum have received their emphasis in American education, it seems now that the tendency is to a rather general concentration upon the problem of character education in the public schools. Studies of crime and the work of several scores of American research scholars has given this movement an impetus which will make it the major concern of American educators for the next several years. Recent volumes dealing with this problem are: May and Hartshorne, *Studies in Deceit* and *Studies in Service and Self-Control;* Starbuck and Shuttleworth, Vol. I, *Fairy Tale, Myth and Legend;* and Starbuck and Others, Vol. II, *Fiction.*

ELEMENTARY TEACHERS

Pre-Training Period.—While most of the teacher training programs in the normal schools and teachers colleges are of two years or less duration, there is much discussion now of the extension of the teacher training program of elementary teachers to a four-year course. Some schools have already inaugurated a four-year program. It is expected that this movement will be accelerated considerably in the next few years, particularly so if the present discrepancy between supply of teachers and demand for them continues.

Supply and Demand.—Various studies of supply and demand of teachers in several of the states have caused concern among educators. In some city school organizations they approve lists for appointments as long as three years before appointment is made. A considerable number of states are training more than twice as many teachers as are required for the vacancies materializing within the states. This has led not only to discussion of the extension of the number of years of training required, but also to consideration of plans for the selection of students previous to admission to teacher training institutions.

PUBLICATIONS AND RESEARCH

Journals.—There are now over 400 weekly or monthly periodicals published in the United States designed for the consumption of those interested in professional education. Most of these periodicals are devoted in whole or in part to articles pertaining to elementary teachers, principals or supervisors. Approximately 100 of them would be considered national in scope. The remainder are regional journals or local teacher house organs. Articles dealing with the newer points of view and including educational principles, educational objectives and illustrative classroom materials may be found in such educational journals as: *Progressive Education, Educational Method, Bulletin of the Department of Elementary School Principals*, N. E. A.; *Elementary School Journal*, Teachers College Record, Childhood Education.

Books.—One of the outstanding books which presents material helpful to teachers desirous of introducing into classroom education the modern principles promulgated by educational philosophers is *The Teacher in the New School*, by Martha P. Porter.

Research Organs. — Numerous educational journals give considerable space to reports of research. The Educational Press Association of America publishes a list of these journals annually. The *Journal of Educational Research* published by the American Educational Research Association is generally accepted as the standard organ. The United States Bureau of Education publishes bibliographies of research annually.

SECONDARY EDUCATION

By Philip W. L. Cox

Professor, New York University

GROWTH OF HIGH SCHOOLS

Housing and Enrollment.—The growth of American high schools has been one of the most conspicuous and potentially significant developments of post-war America. Throughout our country new commodious high schools have been built, testimonials to the faith and sacrifice of communities in the cause of universal adolescent education. In 1930 there are estimated to be some 2,200 secondary schools, 175,000 high school teachers and 4,500,000 high school pupils. (U. S. Office of Education *Bulletin*, 1929, No. 35.) A great majority of the high schools are very small and are located in buildings used also by elementary school pupils. Indeed, over 30 per cent of the schools enroll fifty pupils or less. Only a quarter of the high schools which reported to the Office of Education in 1928 that they were housed by themselves. The typical high school belongs, however, to those which are separately housed; for, despite the great number of small institutions, they contain only a small minority of high school pupils.

Urban Influence.—The public high school is in fact a reflection of the urbanization of American population. The regular four-year high schools have 61.6 per cent of their pupils in places having a population of 2,500 and more, and the "reorganized" junior and senior high schools have 83.3 per cent in the larger centers of population. Moreover, the longer school year (over 160 days) is almost universal in urban centers.

Current Characteristics. — The longer school year, the almost astounding enrollments of adolescents in the high school, the greater persistence of pupils to graduation (53 per cent in 1928) and the greater number of boys who remain in high school after the age when they may legally withdraw are characteristics of the public high school of 1930.

School Architecture.—The school as an institution has been changing somewhat empirically during the past two decades. School architecture is, indeed, a reflection of the new administrative and student-centered activities of the modern high school. Gymnasiums, auditoriums, libraries, cafeterias, studios, music rooms, administrative suites, and other special rooms frequently occupy 60 to 75 per cent of the floor space of the newer high schools.

THE CURRICULUM

The physical and emotional health of the pupils, their educational and vocational guidance and adjustments, their social-civic institutional life, and their recreations have received increasingly assiduous and sometimes intelligent attention from high school faculties. Curricular practices in music, art, commercial subjects, and practical and home arts are undergoing radical modifications; diversity of experiences and outcomes characterize the work in these subjects. The academic curriculum has been less dramatically modified. Progressive leaders in the mathematics, ancient and modern language, social science, natural science, and English fields are sponsoring modifications in curriculum content and methods of great potential value; but the effects of
most of the propaganda are ver
gradual.

ECONOMIC PHASES

Meantime, the industrial revol
tion has made the labor of youth
uneconomical and has released almos
an entire generation for high scho
attendance. Indeed, high wages hav
been maintained by decreasing th
labor supply. The prosperity whic
has made possible the construction c
beautiful school buildings and th
payment of teachers' salaries, i
partly based upon and absolutely re
quires the continued school retentio
of adolescents. The economic depres
sion, which this country, togethe
with the rest of the Western Worl
has suffered since 1929, has cause
a marked feeling of caution amon
high school principals and teacher
during the current year. Magazin
literature, professional meetings, an
the pronouncements of educationa
authorities have been characterized b
a need of revaluation and more com
prehensive planning. The meeting
of the Department of Secondar
School Principals of the Nationa
Education Association in February
1930, dealt largely with the financia
justification of secondary schoo
practices.

PLANS AND SURVEYS

Looking to the Future.—The yea
1930 in secondary education has bee
characterized by an increasing read
ness on the part of school administra
tors and their associates to take ac
count of stock, to seek reorientation
and to plan more wisely and compre
hensively for the future. Local an
state surveys of education during th
past few years have indicated man
shortcomings in the secondar
school's provisions, both curricula
and administrative. State legislatio
and court decisions have proved th
utter futility of any conservativ
program of secondary school adjus
ments.

Program Collaboration.—The Ne
York State Academic Principals an
the State Education Department hav
collaborated to formulate a philoso
phy and to frame a program for se
ondary education which shall be ad

quate for a new day. Briggs' Inglis lecture, "The Great Investment," which aroused the enthusiasm of most progressive school men and almost bitter hostility among conservatives was the outstanding expression of the spirit of reorientation referred to in the preceding paragraphs.

New Jersey Survey.—The publication of the New Jersey State School Survey has stimulated positive planning among the high school officers of that state. Its publication followed so shortly after the defeat of the high school principal's legislative committee's efforts to prevent the passage of school attendance laws which were advocated by the Trade and Labor Council and the Manufacturers' Association, and after the pronouncement by the State Supreme Court that school boards are obliged to provide day school opportunities for all youths between five and twenty years of age, that administrators are at last awake to the realities of the situation. These realities require the institution of a school program adapted to the whole range of normal adolescents.

California and Ohio.—In California and in Ohio similar challenges have been before the schoolmen of the state for some years, but legislation makes the problem more definite and inescapable each year. After September, 1930, in California, all unemployed youths under eighteen years of age in communities which maintain part-time schools must attend these schools three hours daily or the regular high schools five hours daily. Since these pupils have left school, in many cases, because they dislike the regulation school regimen, the operation of this new law is looked upon, by well-informed persons, as education's greatest "leap in the dark."

National Survey.—Of far greater general interest, however, has been the launching of the three-year National Survey of Secondary Education authorized by Congress in 1929 with an appropriation of $225,000. This survey is directed by Commissioner W. J. Cooper, with L. V. Koos as the Associate Director. Three committees work with them: one of the "expert consultants," an advisory committee of thirty educators, and a committee of prominent laymen. The work of the survey is being carried on by special investigators with the aid of research assistants. It deals with the organization of schools and districts, the secondary school population and related problems, administrative and supervisory problems, and the curriculum and related problems.

Miscellaneous Surveys.—Other nationwide organized efforts effectively supplementing that of Secondary Education are the National Teacher Training Survey, the National Committee on Vocational Guidance and Child Labor, the National Industrial Conference Board, and the National Advisory Committee on Education.

TENDENCIES AND STANDARDS

The very atmosphere in which secondary education exists in the current year is surcharged with expectations of great changes to come in school curriculum administration and pupil guidance. There is a marked tendency to accept if not to welcome the inevitable dissolution of scholastic standards and the substitution therefor of differentiated educational development of each youth according to his nature and capacities and according to the diverse activities which social life requires.

COLLEGIATE EDUCATION

By Arthur J. Klein
Ohio State University

CRITICISM

Reaction.—Criticism of American higher education continues, but it is more closely related to constructive action than much of the carping complaint that characterized comment on the higher institutions shortly after the World War. With the recent slowing up of the rate of increase in enrollment, colleges have been encouraged to action appropriate to meet the findings of scientific and semi-scientific studies of instruction and administration made during the period when the influx of students freed them from concern about securing students. Visits to many colleges during the year reveal cautious but positive progress in the practical application of theoretical conclusions in regard to curriculum construction, methods of instruction, departmental organization and adaptation of educational means to the accomplishment of more carefully formulated institutional aims.

Flexner.—The outstanding criticism of the year, Dr. Abraham Flexner's book, *Universities*, is somewhat out of harmony with the general tendency to study the problems of specific institutional situations and find remedies appropriate to the case being considered. It is also out of harmony with tendencies that are pretty well established in American interpretations of the functions of higher education. Dr. Flexner sets up a very high ideal of collegiate education and one which all educators probably accept as a legitimate and necessary part of the functions of American colleges. However, the somewhat abstract ideal of scholarship operating largely without reference to its uses neglects the very real need for college and university instruction in the fields of applied physical and social sciences and is directly antagonistic to the conception, dearly cherished by Americans, that every competent individual is entitled to the aid of higher institutions in exploring fields of knowledge, even though the aspects chosen for study may be in the individual's educational experience unrelated to a coördinated and well-rounded special or general education.

COLLEGE ENROLLMENT

One of the notable results of the slackening of enrollment in the colelges has been a marked revival of student recruiting activities. Visits to the colleges that covered the entire breadth of the United States show many instances of increased appropriations for student recruiting, the employment of an increasing number of field secretaries, and a return to extreme competition for student attendance that threatens to become almost as scandalous in the academic field as is the recruiting charged to the development of athletic teams. The financial depression that has prevailed has accentuated the need of the more poorly supported colleges for the funds that students pay in the form of tuition and other fees. The institutions are, in many cases, geared to a scale of operation that does not permit rapid readjustment of plans that were developed during the years of phenomenal growth in college enrollment.

OUTLOOK FOR THE SMALL COLLEGE

The development of very large institutions, the pressures for enrichment of educational offerings to accommodate larger student bodies, and the depression which it was feared would reduce financial contributions, have all worked together to make more lively the concern of many with reference to the future of the small denominational or liberal arts college. The general stirring in higher educational thought that has characterized the past five or ten years has combined with these influences to stimulate the liberal arts colleges to seek vigorously during the past year for solution to their problems. One of the most interesting of these attempts has been the formation of an Association of Liberal Arts Colleges for the purpose of a publicity and promotion campaign to secure greatly increased endowments for institutions of this type. The figure of $200,000,000 increase in the endowments of liberal arts colleges is quite frequently suggested as a solution for their difficulties. Such an endowment would yield only about $10,000,000 a year. Several single institutions have budgets in excess of this total amount. It appears that the financial solution on the basis of these suggested figures will probably prove inadequate

Nevertheless other tendencies seem to point the way to better definition and performance of the functions that the smaller colleges exercise. The discussion that followed the meeting of the Association of American Colleges in 1929 which devoted itself to the problems of college teaching, had considerable effect in producing a general breakdown of the self-complacence and time-honored conventions of liberal arts institutions. One phase in this process may be traced to revolt against mistaken conceptions of the functions of psychological testing and of new type tests of various kinds. For a period it was assumed, and it is still assumed by some persons, that these new tests furnish an instrument for the measurement of institutional and educational achievement. Considerable experience in the use of the tests over a number of years has led to general acceptance of the conclusion that their values were very real, but it is now well recognized that the educational process involves changes in attitudes and character, which these tests cannot measure. In as much as many of these outcomes of education arise in large part from association in relatively small groups and since such association is of a kind that the small college is especially well fitted to provide, a revival of interest and faith in the functions of the small college has apparently resulted. Such values have been authoritatively recognized through acceptance of the Harkness gift by Harvard University to provide for living in the university under conditions comparable to those of the small college. The revival of confidence and the development of an aggressive determination to attack the problems of the small college under conditions of realism is manifested by the increased vigor taken on by the Association of American Colleges.

UNIVERSITY OF CHICAGO PROGRAM

No more striking illustration of the tendency to seek practical applications of theoretical conclusions and scientific findings concerning curriculum construction, educational organization and adaptation of instructional procedures is afforded by the year than that found in the reorganized program of the University of Chicago. Recent educational thought in regard to the relations of the junior college or lower division to the senior college, in regard to the relationship of general education to specialization, in regard to multiplication of courses, separatism between departments and the entire series of lock-step requirements associated with time, credit and grade prescriptions, is given practical application in this reorganization. While the reorganization is frankly an experimental procedure in which many important problems still remain to be worked out, it demonstrates in noteworthy fashion the seriousness with which higher educational institutions are seeking to embody in changed practice the results of constructive criticism of traditional methods.

In the reorganization at the University of Chicago the junior college is retained as one of five major divisions with its own faculty, budget and dean. It is intended to carry on the student's general education begun in high school and to provide a degree of preparation for specialization in one of the other four major divisions—the humanities, the social sciences, the physical sciences and the biological sciences. All members of the college faculty are also members of the faculty of one of the other major divisions. The time that the student will spend in the college is not determined by the accumulation of credits or the passing of courses, but by the application of his previous preparation and of his ability and industry to demonstrate his competence to carry on higher work by the passing of a comprehensive examination. His high school work thus becomes significant, not as marking his progress over a certain number of hurdles in the race for higher education, but as providing a degree of genuine intellectual attainment which will be of direct value in his later educational career.

The four other divisions tend to break down sharp departmental cleavages by requiring divisional approval of all courses offered by the departments within the divisions and by providing that the student shall pass comprehensive divisional examinations with emphasis upon the field of his specialization rather than course examinations conducted by the departments. Further the four divisional faculties are responsible for both undergraduate and graduate work in their appropriate areas, thus eliminating the curious administrative organization that has developed in American universities under the name of the graduate school.

An essential element in the reorganization is the divorcing of the examining function from the instructing function. The examining function is assigned to a Board of Examiners, thus freeing instructors and students from the taskmaster relationship that has in the past hampered the work of both. Dean George A. Works has been designated to head up the work of administration of the comprehensive examinations and to direct the work of admissions, educational and vocational guidance, and the development of a program of student recreational and social life. This extra-divisional office corresponds in rank with that of the divisional deans.

SURVEY OF LAND-GRANT COLLEGES AND UNIVERSITIES

One nation-wide study in the field of higher education was completed and the report published by the U. S. Office of Education in December, 1930. This study of the sixty-nine federally aided higher institutions was undertaken at the request of the Association of Land-Grant Colleges and Universities in 1927. Congress made a special appropriation for the purpose at that time and the three-year study was carried through with the coöperation of the institutions concerned and with the assistance of a considerable group of scholarly associations. More than 80 specialists participated as members of the staff in the work of the survey. The report issued by the Superintendent of Public Documents consists of two volumes of slightly more than 900 pages each. The two volumes are divided into twenty-one parts, also published as separate bulletins, which deal with specific aspects of organization, control, administration, instruction and institutional life.

The entire survey report is characterized by the completeness and convenience of factual presentation and by conservatism of interpretation of data. As is to be expected the parts vary considerably in thoroughness and merit. Probably the portions of the survey dealing with alumni and former students and with student relations and welfare will command the greatest popular interest; those dealing with the library and with professional veterinary medicine probably contribute most to consideration of distinct phases of higher educational activity; while the sections on home economics and arts and sciences are most significant from the standpoint of educational theory and interpretation.

Importance is added to the appearance of this evaluation of the higher institutions that receive Federal subsidies by the discussion that has developed during the year concerning the relations of the Federal Government to education. This discussion was stimulated by a Memorandum of Progress issued in July, 1930, by President Hoover's National Advisory Committee on Education. This preliminary report recommends: (1) Increased Federal support for educational research and statistical studies; (2) The creation of a Federal headquarters to secure coöperation among all federal agencies with respect to the educational aspects of their work; (3) The annual grant to the states of $2.50 per child under 21 years of age, without restriction upon state use of these funds other than that they shall be used for educational purposes; (4) The repeal of all annual Federal grants for special phases of education and of all grants that authorize Federal supervision of state educational or research activities, with the condition, however, that for a five-year period each state must allot from the new grant to each specific educational activity now receiving federal funds an amount equal to that now received; (5) That each state submit to the Federal Government annually a financial audit and report covering the uses of the federal grant; (6) That the amount of the per capita grant be readjusted at each census period. The memorandum condemns "in the field of education at least," Federal money grants both general and special which require that the states appropriate equal amounts.

In as much as the land-grant colleges and universities benefit most largely from Federal aids to education, the survey of these institutions provides a factual basis for estimating the effects of the historical policy of Federal educational subsidies that President Hoover's Advisory Committee now proposes to abolish. From the standpoint of the land-grant colleges and universities the most forceful objection to the plan proposed by the Hoover Committee arises from the five-year political struggle between state educational agencies that would result from attempts to secure legislative allotment of Federal funds to specific institutions and activities. It is stated that discords and political conflicts between separate land-grant colleges and state universities, between state universities and teachers' colleges, and between publicly supported higher institutions and the public schools, would be revived and perpetuated by reason of perennial attempts to secure from the legislatures reallocation of the Federal grants to the states. On the other hand, the proposal would open the way to state universities that are not land-grant institutions to secure a share in Federal funds that are now specifically assigned under law to the land-grant institutions. Although the argument has been advanced that the proposals of President Hoover's committee permit assignment of Federal funds to private institutions that are capable of contributing to the development of a state's educational program, the probability of such allotment is remote in view of the deep-seated popular opposition to public aid to private educational corporations beyond that accorded through tax exemption.

NATIONAL SURVEY OF TEACHER TRAINING

A national study of teacher preparation under the auspices of the U. S. Office of Education, authorized by Congress early in the year, was started in July, 1930. Dr. Edward S. Evenden of Teachers' College, Columbia University, was placed in immediate charge of this survey and Ben W. Frazier, senior specialist in teacher training of the U. S. Office of Education, was designated as Dr. Evenden's administrative assistant. Two hundred thousand dollars is available over a three-year period, appropriated by Congress for the teacher training study.

Announcements of tentative plans concerning the scope of the survey indicate that it will deal with the qualifications of teachers in public schools, the available supply of teachers, the facilities available and needed in teacher training, including courses of study and methods of teaching.

Two books upon the problems of higher educational institutions have appeared that are apparently attempts to provide convenient presentations that may serve as texts for use in meeting the demand that has arisen as a result of more general study of higher institutions.

The first of these, of which R. A. Kent, president of the University of Louisville, is the editor, consists of a series of twenty-two papers by well-known educators written specially for this collection or adapted from their earlier treatments of the same topics. Twelve of these papers deal with specific units or professional schools, such as the junior college, the college of liberal arts, the schools of education, engineering, law and medicine, and ten with such general problems as selection of students, student accounting and student activities, the curriculum, improvement of instruction, boards of control and budget preparation and use.

The second of these books was prepared by Dr. E. O. Holland, president of Washington State College, and Dr. E. E. Lindsay, now secretary of the Oregon State Board of Higher Education. It brings together in convenient form a presentation of the various aspects of higher educational administration and of the practices that prevail in organizing and handling administrative problems in specific colleges and universities.

Both of these books should prove of use, the former because of the variety of the problems covered, and the wealth of material assembled, and the second because of the pains that have been taken to present concretely methods of procedure which have proved useful in the administration of higher institutions. Neither book, however, meets the need that exists for presentation of the many agencies and forces of institutional life from the standpoint of unified management and articulation for the single purpose of aiding the student to develop his intellectual and social powers.

ACCREDITING STANDARDS

Probably the most significant evidence that the year affords of movements to vitalize criticism of higher education by expression of its results in practical measures, is the action taken by the North Central Association of Colleges and Secondary Schools, looking to thorough-going revision and adaptation of its standards for accrediting colleges and universities. A distinguished committee of fifteen educators was appointed by the Association under the chairmanship of President Coffman of the University of Minnesota, to consider preparation of standards for accrediting that would serve more effectively than the present standards as criteria of educational effectiveness. An active sub-committee was employed to make a preliminary study of the problems involved and to make recommendations concerning the scope and nature of a vigorous investigation to be carried on by the Association over a period of years. The sub-committee completed its work of visiting colleges in December, 1930, and will make its report early in 1931. The significance of this attempt of the Association to adjust its standards to the most recent conclusions of educational thought lies primarily in the encouragement that it should afford to individual institutions to develop specific purposes, and educational offerings and procedures designed to attain these objectives, without too much concern about the purposes and practices of other institutions, in other words to develop creative rather than merely imitative programs and methods.

EDUCATION FOR THE PROFESSIONS

By Alonzo F. Myers
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In this article it has been possible to present only a brief report of some of the significant developments in a few of the professions.[1]

LEGAL EDUCATION

Standards of Supervising Agencies.—Neither the Association of American Law Schools, at its annual meeting held in New Orleans, December, 1929, nor the American Bar Association, meeting in Chicago, October, 1930, made any change in their virtually identical sets of standards. At the latter meeting the Section of Legal Education defeated by a large majority a proposal that every approved law school must have among its teachers a sufficient number of practising lawyers or lawyers with at least ten years of experience at the bar. Instead, the Council on Legal Education was directed to take under consideration the problem of bringing law students into personal contact with members of the profession of high standing.

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[1] The author is indebted for significant contributions to the materials presented in the several sections of this article to the following persons: On Legal Education, Alfred Z. Reed; on Medical Education, Fred C. Zapffe, Alan M. Chesney and Torald Sollman; on Engineering Education, H. P. Hammond; on Education for Business, Paul S. Lomax.

Bar Admission Requirements.—During the year nineteen states amended their rules for admission to legal practice. Although the changes were usually improvements, none was of the first importance. Out of 49 jurisdictions (48 states and the District of Columbia) still only 15 require all applicants to have secured a specified amount of general education, and, following this, to study law during a specified number of years; and of these only eight (New York, Pennsylvania, Ohio, Illinois, Michigan, Minnesota, Kansas, and Colorado) have set a standard of general education as high as the two years of college recommended by the American Bar Association. Three additional states (Connecticut, Wisconsin and Wyoming) continue to require this much preliminary education in the case of law school students only. The two states last named, and three more (West Virginia, Montana, and —beginning 1933—Idaho) have a general two-year college requirement that need not be satisfied until the applicant takes his bar examination.

Law School Statistics.—In 1929-30 the degree-conferring law schools in the United States numbered 180, of which 80 were full-time, 77 part-time, and 23 of the "mixed" type, maintaining separate full-time and part-time divisions. As compared with the year before, there were two additional full-time schools, three additional part-time schools, and two additional schools of the "mixed" type. The autumn attendance at each group was as follows: Full-time (complete), 15,181, being a gain of 103 over the year before; part-time (7 schools not reporting), 15,947, being a loss of 487 over the year before (4 schools not reporting); "mixed" type (2 schools not reporting), 12, 793, being a loss of 2,013 over the year before (2 schools not reporting); total for all schools, 43,921, being a net loss of 2,397. Of the students attending schools of the "mixed" type, 4,033 were in the full-time and 8,760 were in the part-time divisions. At the close of the academic year, 62 of the full-time schools (77½ per cent) were members of the Association of American Law Schools, and these, with 3 others (making 81 per cent), had been approved by the Council on Legal Education as complying with the standards of the American Bar Association. No exclusively part-time school had qualified under the standards of either Association, but 4 of the "mixed" type were members of the Association of American Law Schools, and these, with 2 others, had been approved by the Council on Legal Education. Schools approved by the Council contained 89 per cent of the exclusively full-time attendance, 19 per cent of the attendance at schools of the "mixed" type, and 36 per cent of the total attendance at all law schools.

Research and Law Reform.—New organizations started during the year, in connection with law schools, include an Air Law Institute and a Scientific Crime Detection Laboratory, affiliated with Northwestern University; a Committee for Research in the Social Sciences at Yale University, and a Foundation for Research in Legal History at the Columbia University School of Law. The University of Michigan Law School has been left a large bequest available for similar purposes. The American Law Institute has completed the preparation of a model Code of Criminal Procedure, begun in 1925.

MEDICAL EDUCATION

Modifications in the Curriculum.—It continues to be the practice of the Association of American Medical Colleges to encourage individual medical schools to undertake experimental programs and innovations relating to the medical curriculum and to methods of instruction. The results of these experiments are reported annually to the Association of American Medical Colleges. While no new experimental programs were inaugurated during the year, several of those which were begun in 1929 or earlier are being continued with considerable promise of success. The experiment being conducted at the School of Medicine, Western Reserve University, in placing class attendance largely upon a voluntary basis, is progressing satisfactorily. The curricular experiment being conducted at the School of Medicine, Johns Hopkins University, an outstanding feature of which is the provision of much free time which medical students may utilize along the lines of their individual interests, is being continued with only minor modifications. The success of this experiment will depend largely upon how the students spend their free time. The first and second-year students devote the most of their free time to additional work in one or more of the pre-clinical subjects, particularly Anatomy. A few second-year men devote some attention to clinical work in the fourth quarter. A small number engage in a limited fashion in research work. Much of the free time in the fourth quarter is devoted to study in preparation for the examinations at the end of the second year. A large share of the free time of the third-year students is devoted to clinical work. A considerable number of third-year men devoted one quarter to substitute interneships in hospitals. The fourth-year students spent their free time very much as did the third-year men, about one-half of them in various elective clinical courses. Eight students spent a quarter or more as substitute internes in hospitals. Three students went abroad for one quarter, and two spent a quarter at the Medical School of Harvard University. Eight students devoted their free time to research work. It is believed that oustanding advantages of the curriculum as administered at present are: (1) the abundance of free time makes possible the cultivation of any special interest that the student may have acquired; (2) it encourages the development of special interests; (3) it forces the student to give considerable thought to his own medical education.

Aptitude Test for Admission.—One of the outstanding developments of the year in the field of medical education was the official adoption by the Association of American Medical Colleges, of the Aptitude Test as an additional criterion for the selection of applicants for admission to medical schools. All aspects of this important problem of selective admissions are receiving careful study.

Changes in Method of Licensing.—The Federation of State Medical Boards has definitely committed itself to the standards of the Association of American Medical Colleges and has requested that Association to assume responsibility in all matters relative to medical education and teaching up to the point at which the graduate presents himself for licensing. When he so presents himself it will be with the understanding that the Association tacitly vouches for him. In order to discharge this obligation effectively the Association of American Medical Colleges must provide machinery of administration far greater than it now has, and to that end, at the last annual meeting the annual dues were increasel from $100 to $250. Plans are now being made to outline the activities that must be added to make it possible for the Association to assume the increased responsibility with assurance of success. These plans will be presented at the next annual meeting of the Association for discussion and action.

The Association of American Medical Colleges is prepared to broaden its field of action to include all matters of medical education and teaching from the medical school standpoint. This will include making studies which should be of value in promoting better education and teaching and in increasing the professional worth of the graduate to the community he serves. Furthermore, the Association will take a greater interest in graduate medical education to the end that the foundation laid in the course of undergraduate training will be utilized to lay on it a superstructure consisting of further study in general lines of practice or special fields. It should be recognized that the medical school cannot train a surgeon. It can only lay the foundation. By further study over a number of years, following outlined courses, the medical graduate may prepare himself to be a really competent surgeon, or any other special practitioner.

General Trend in Medical Education.—The general trend in medical education continues to be that of gradual evolution, guided by experimental practice. There is an increasing emphasis on cerebration rather than memorization, on cultivating the graduate point of view, but with limitations imposed by the practical problem of covering the necessary factual material and technic. There is a definite understanding that every effort should be made to emphasize principles over details. In all respects the situation has been materially improved by envisaging the scope of the medical school as a preparation for interneship rather than for immediate practice.

EDUCATION FOR THE MINISTRY

Academic Training of Ministers.—Education for the ministry falls far short of the high professional level of preparation which is commonly believed to be characteristic of the preparation of ministers. This is one of the interesting facts disclosed by an analysis of unpublished data gathered in the 1926 Census of Religious Bodies conducted by the Government. (*The United States Looks at Its Churches*, by C. Luther Fry, Institute of Social and Religious Research, New York, 1930.) The survey disclosed wide variations in the preparation of ministers. Ministers serving in urban communities are much better trained than those serving in rural communities. Twenty-five thousand city ministers representing 17 white Protestant denominations reported that 52 per cent were graduates of both college and seminary, and that only 20 per cent were not graduates of college or seminary. The reports of 46,000 rural ministers representing the same white Protestant denominations showed that only 23 per cent were graduates of both college and seminary, and that 53 per cent were not graduates of either. There are important differences among the various denominational groups as to the amount of training possessed by their ministers. The denominational group making the best showing in this regard reports that 2 per cent of the urban ministers and 4.8 per cent of the rural ministers are neither college nor seminary graduates. The one at the other extreme reports that 74.2 per cent of the urban ministers and 92.2 per cent of the rural ministers are neither college nor seminary graduates. The percentage of the Catholic clergy who are neither college nor seminary graduates is much lower than is the case for Protestant clergy. Only 6.6 per cent of the Roman Catholic priests were not graduates of college or seminary. Sixty-eight per cent claimed to be graduates of both college and seminary. The reports of the ministers of 17 white Protestant bodies show that 41 per cent were not graduates of college or seminary, while 33 per cent stated that they were graduates of both college and seminary.

Survey of Theological Education.—A survey is now being conducted under the designation "A Study of Theological Education in the United States and Canada." This survey is under the auspices of the Conference of Theological Seminaries in coöperation with the Institute of Social and Religious Research. The survey includes the Protestant denominations only. The main aspects of the study are: 1. The Theological Institutions; 2. Study of the Ministerial Profession; 3. Study of the Denominational Boards that are concerned with Theological Education.

Modifications in the Curriculum.—In the curricula of the Protestant theological seminaries there is an increasing emphasis upon the practical aspects of the preparation of ministers as evidenced by additional courses dealing with field work and field problems and courses in religious education, educational psychology, and sociology. The seminaries are also devoting more attention to the improvement of ministers in service through the agencies of summer schools, extension courses, and correspondence courses.

ENGINEERING EDUCATION

Enrollment.—The increase in enrollment of engineering students mentioned in this survey last year continued in 1929-30, and, from indications given by tabulations in *School and Society*, appears to be continuing in 1930-31. The gain in enrollment of engineers in representative institutions is about 5 per cent per annum on the average. The increase in graduate students of engineering is much more rapid than that of undergraduate students. This trend is one of the most significant developments in engineering education.

Postgraduate Work.—In 1924-25 there were approximately 1,000 graduate engineering students enrolled in colleges in the United States and Canada. Three years later this number had grown to 1,600. Statistics are not available, but it is certain that the number now exceeds 2,000. One out of every five students receiving his first degree in engineering now returns to college for post-graduate work. The bulk of this enrollment is in a comparatively small number of institutions. The Massachusetts Institute of Technology leads with nearly 400 graduate students; the University of Pittsburgh has over 300; Brooklyn Polytechnic Institute has approximately 250; the University of Pennsylvania nearly 100; Harvard University approximately 75.

Engineering Research.—Research work by engineering colleges is showing a steady increase. This development is in fact paralleling closely the increased emphasis on graduate work. One of the most notable additions to facilities for research was the completion during the past year of the new materials testing laboratory, a part of the engineering experiment station facilities of the University of Illinois. Problems concerning the relationship between teaching and research are under active discussion at the present time. Evidence of this is the report of a committee headed by Dean Robert L. Sackett, of Pennsylvania State College, before the engineering division of the Land Grant College Association.

Aeronautical Engineering. — During the past few years there has been a rapid increase in facilities for and attention devoted to aeronautical engineering in American colleges. From 1926 to 1930 the Daniel Guggenheim Fund for the Promotion of Aeronautics expended nearly $2,000,000 for the promotion of aeronautics, chiefly in the field of aeronautical education. The Massachusetts Institute of Technology, University of Michigan, California Institute of Technology, Stanford University, Syracuse University, University of Washington, and Georgia School of Technology received grants through which increases in equipment and personnel were made possible. The Guggenheim Fund has thus aided in the establishment of centers for aeronautical education in various sctions of the country, two in the East, one in the Middle West, three in the West, and one in the South. The Fund had previously established the Daniel Guggenheim School of Aeronautics at New York University. A number of the other institutions which do not offer complete curricula in aeronautics have instituted certain courses of instruction in this field. Student enrollment has increased even more rapidly than facilities for aeronautical education.

Summer School for Engineering Teachers.—The Summer School for Engineering Teachers of the Society for the Promotion of Engineering Education offered two sessions in the summer of 1930, one for teachers of civil engineering at Yale University, of three weeks' duration, and one for teachers of drawing and descriptive geometry, at the Carnegie Institute of Technology, of two weeks' duration. The civil engineering session was attended by 90 teachers from over 60 institutions in all parts of the country, and the drawing session was attended by nearly 100 teachers representing 57 institutions. The combined staffs of the two sessions comprised 65 individuals recruited from among the leading teachers, engineers and scientists of the country. These two sessions were the largest the Society has held, and brings the total enrollment in the Summer Schools since their establishment in 1927, to nearly 650 individuals. As in past sessions, a portion of the program was devoted to basic problems of teaching, a part to the particular problems of teaching the subjects in question, and a part to applications in industrial practice. The Society announces that two sessions of its Summer School will be held in 1931, one for teachers of chemical engineering, to be held at the University of Michigan in June and July, and the other for teachers of mathematics, to be held at the University of Minnesota, in August and September. Prof. H. P. Hammond, of the Polytechnic Institute, continues as the Director of the Summer School.

Engineering Building.—During the year a number of notable additions were made to the engineering buildings of American Colleges. Space does not permit of the mention of more than a few of these. Lehigh University dedicated its new James Ward Packard Laboratory of Electrical and Mechanical Engineering. Purdue University completed the first wing of its new group of buildings for mechanical engineering; Pennsylvania State College put into use its new main engineering building, provided a new structure for mining engineering and made a number of additions to other buildings on its campus. The Massachusetts Institute of Technology announced plans for new units of its buildings for physics and chemistry; and the University of Illinois, as previously mentioned, dedicated its notable structure for the testing of materials. The University of Wisconsin also completed a new mechanical engineering building.

EDUCATION FOR BUSINESS

Commercial Teachers for Secondary and Collegiate Schools.—There are four developments of professional education for business during the year 1930 that are particularly noteworthy. The first is with regard to the preparation of commercial teachers for secondary and collegiate schools. Such teacher-training facilities have been extended at the Universities of Denver, Pennsylvania, Pittsburgh, and Southern California, where professorships of commercial education have been created. There is evidence that a number of other universities will take similar steps during the next five years. Constructive leadership in this matter is being given by the National Association of Commercial Teacher-Training Institutions.

Books.—The second development is the 1930 yearbook of the Eastern Commercial Teachers' Association, entitled, *Administration and Supervision of Business Education.* This book of 236 pages contains (1) an analysis of first principles of educational administration and supervision, and (2) an interpretation of these principles in various types of educational institutions and in various business subjects offered by these institutions. In addition, progress was made in a few new books on special methods, and in numerous excellent books on the subject matter of business.

Regional Organization.—The third development has to do with a plant of organizing business education of this country into four great regional associations: Central, Eastern, Southern and Western, with these four, in turn, represented in an American Council on Business Education. (The Eastern Commercial Teachers' Association and the Southern Commercial Teachers' Association already exist.) There is real need of a national plan of coördinating the professional activities of numerous local, state and regional associations of business education, in which plan both American business educators and business men should be duly represented.

International Society for Commercial Education, American Chapter.—The fourth development is the recording of substantial progress looking toward the formation of an American chapter of the International Society for Commercial Education in which many of the leading nations of the world have chapters. Last September the president of the International Society visited this country and interviewed President Hoover and a number of leading American business men and business educators on the matter of establishing an American chapter. It is probable that by another year the present organization committee will have succeeded in the formation of the chapter.

PROFESSIONAL EDUCATION OF TEACHERS

National Survey of Teacher-Training.—The 71st Congress appropriated $200,000 for a nation-wide survey of teacher-training to be conducted by the United States Office of Education. The survey, which will require three years to complete, was launched July 1, 1930, under the leadership of the United States Commissioner of Education, William John Coopr, and Dr. Edward S. Evenden, who will serve as Commissioner Cooper's associate in the direction of the survey. Some of the most important questions which the survey will endeavor to answer are: How well are American teachers trained for their work How much and what kind of academic education have they had? What training have they received in methods of teaching, child psychology, and other purely professional subjects? What preparation have they had in directed observation and in student-teaching before they began teaching under contract? How closely related was their preparation to their teaching duties after they secured positions? The survey will make possible an appraisal of some of the widely divergent policies and practices in teacher preparation which prevail in this country. It will show the important differences in the preparation for teaching provided by normal schools, teachers' colleges, liberal arts colleges, and universities with regard to such items as relative time spent on academic and professional subjects, and provisions for demonstration and student-teaching. A study will be made of the differences which exist in the preparatio of rural, village and city teachers, c elementary and secondary teacher and of teachers of different subject The problem of the supply of an the demand for trained teachers wi be studied carefully.

Requirements for Certification.– As a result of the increasing surplu of candidates for teaching position in public schools in all parts of th country, there is a marked tendenc to increase the requirements for ad mission to the teaching professio The length of the required prepara tion for elementary teaching in som states is being increased from tw years to three years. Several citie now require four years of preparatio after high school graduation fo teaching in the elementary school. Fo high school teaching there is a te dency to increase the requirement o professional study. At the same tim teacher-training institutions in se eral states have inaugurated pr grams of selective admissions to thes institutions.

The American Association o Teachers' Colleges held its annua meeting at Atlantic City in February The meeting was devoted very largel to a consideration of standards fo accrediting institutions which trai teachers.

Regional Conference on Teacher Training.—The Fifth Annual Confer ence of Normal Schools and Teachers Colleges of the East was held at th Pennsylvania Hotel in New York Cit in April. This conference was at tended by administrative officers, in structors and students in teacher training institutions located in th eastern section of the United States At this meeting the name of the or ganization was changed to Eastern States Association of Professiona Schools for Teachers. This chang was made in recognition of the en larged program and functions of th organization. *Problems in Teache Training*, Vol. V, gives in detail th proceedings of this conference.

VOCATIONAL EDUCATION

By Charles R. Allen
Federal Board for Vocational Education

GENERAL PROGRESS

During the past year programs of vocational education have developed normally. State and federally aided work of less than college grade shows a normal increase both in enrollment and in increasing spread of service. Vocational programs operated by private and endowed institutions both at and below professional levels, have continued to develop in about the same way as in preceding years. Since in vocational education of less than college grade, the problems are essentially the same whether programs are conducted under public or private control, no special distinction is made between them in this article. Accompanying this development, however, certain situations are becoming more clearly defined as experience has been secured. This article deals more particularly with these situations as they appear to be becoming more acute in the general development of the work.

SOCIAL FUNCTION AND VALUE

Conflicting Theories.—A number of these difficulties and problems are due to the existence of two conflicting theories as to the major social function of vocational education. While both schools of thought recognize the educational value of vocational education, according to one theory the primary purpose of vocational education is to give additional general education through the utilization of practical activities. According to the second theory, the primary purpose of vocational education is to equip an individual with directly functioning knowledge and skill which he can utilize in getting a job, holding a job, or getting a better job. Out of the conflict of these two points of view there have come many of the problems and critical situations which are now confronting those who are earnestly endeavoring to improve and extend the value of vocational education to society. It can readily be seen that the conflict between these two theories must, of necessity, very profoundly affect what is to be done and how it is done in the development of efficient vocational programs

"Dumping."—The first educational theory is naturally held by many general education administrators. Among other results has been an endeavor to utilize vocational courses for those students who have for any reason failed to make good in regular school work. Since it is now recognized that successful vocational work can be carried on only with those who are capable of thoroughly mastering the instruction and training, and since according to the "economic" theory, only those should be trained who are going to use the training afterwards for the purpose of earning their living, such an administrative policy sets up situations which work against any attempt to give efficient vocational training.

Age of Admission to Courses—Modern psychology recognizes that during progression from infancy to maturity, in each stage of progression, an individual is particularly capable of dealing successfully with certain kinds of educational experiences. So far as the federally aided program is concerned, it is generally expected that it should deal successfully with students of a minimum age of 14 years. This expectation has led to certain difficulties which largely center around the fact that in a number of occupations where the worker comes in contact with the customer questions of maturity enter, so that although the graduate may be technically competent, nevertheless he cannot secure employment because customers are unwilling to have work done by persons so young. This fact has set up the problem of adjusting the training course with regard to what has been termed "the age of effective entrance into employment." This relation between age of admission and age of employment is, at present, setting up serious problems in day vocational schools, particularly in those courses which deal with training for certain wage-earning occupations of a service character. Experiments are now being conducted in the attempt to find a satisfactory solution of this difficulty.

Effects of Specialization.—Practically all productive occupations are becoming increasingly specialized and more and more human skill is being replaced by machine skill. The problem of how vocational courses are to be so modified that they can meet this situation is becoming a serious problem. As in the case of most other educational enterprises, there has been the usual tendency to "lag," so that today we find many vocational schools, public and private, still operating long general courses, such as a two-, three- or four-year courses in "electricity," or in "auto mechanics" or in "commercial work." The apparent solution seems to be the breaking up of such courses into units corresponding to specialized jobs or to recognized employment levels.

Problem of the Short-Course Student.—One trend in this direction has been due to the fact that many students leave day schools for various reasons, usually economic, before they have completed a full length of the training course. Under these conditions the student who has only partially completed a general course is very apt to find himself in the position of knowing "a little about a great many things but not enough about any one thing"to constitute a definite employment asset on the basis of occupational knowledge and skill which he can sell to an employer. The transition from the long general course to groups of specialized units will doubtless be slow, but appears to be the only way in which the vocational program can be correlated with occupational requirements as these are affected by increasing specialization.

ORGANIZATION OF SCHOOL PROGRAMS

Extension of Training.—In the early days of vocational education those concerned were thinking chiefly in terms of training "all around mechanics" for a limited number of skilled occupations. Hence it can almost be said that the vocational school of five or six years ago was as aristocratic as any college preparatory school since it confined its service to a very limited group who desired training for a limited number of occupations. In the last two years, however, there has been a marked trend in the direction of extending the spread of such training. The introduction of such work as training girls for manicure and beauty parlor operators, the tendency to include in some programs of commercial work training for various office machine jobs, are indications of this development. There still remains, however, the fact that large groups of young people who could very greatly profit by training for semi-skilled or specialized jobs are now prevented from taking advantage of that service on account of the present type of organization of school programs.

Expense Problems of the Student.—A second group not now served are those potential groups that are prevented from taking advantage of opportunities for vocational training through sheer economic inability to stay in school. The next step would appear to be to provide some way in which "earning and learning" can go together. This idea has been already developed to a considerable extent in vocational agriculture and in a few trade and industrial schools. An estimate of incidental expenses recently made with regard to one public vocational school showed that it cost nearly $100 a year for a student to attend the school. Many boys and girls are obliged to go to work untrained because of their inability to provide the "extra hundred." An arrangement whereby this economic bar would be removed would unquestionably open up an opportunity to take advantage of vocational training to a large group of young people previous to employment, which is now inaccessible to them.

Need for Elasticity in Organiza-

tion.—The organization of the earlier types of both day and evening vocational school was modeled very largely on that of the high school. It has become very evident that this type of organization will not work if a broader type of service is to be developed. People become conscious of a need for vocational training every day in the year, hence a flexible organization which makes possible what has been designated as "giving anybody what they want when they want it," is gradually taking the place of the more rigid type of organization copied from the general secondary school. The gradual trend is unquestionably in the direction of what is termed "an opportunity type of organization," of which type a few schools are now being operated in this country, notably in Denver. At the present time organization in units growing shorter and shorter is partially meeting this situation, but the drift in thinking, at least, is steadily toward recognizing the fact that the pure opportunity type of school, in spite of all the difficulties which it presents from the standpoint of administration, is really the type of organization which will most closely meet the need of individuals, and hence will make the greatest social return to the community supporting it.

Efficiency Surveys.—During the past year increasing attention has been directed to problems involving the organizing and conducting of vocational programs so that they make the largest return to the community in terms of the time, money and energy expended. A formal procedure for evaluating the efficiency of the administrative set-up has been developed and is now receiving not only considerable attention but a certain amount of use in the states. Where such efficiency surveys have been conducted they have shown many ways by which administrative organizations can be improved in the interests of efficiency.

Occupational Coöperation.—It is now held by many students of vocational education that no program can be efficient unless there are actually real contributions from the educator, the employer, and the worker. This conception has found expression in the establishment of what are known as coöperating committees which have rendered very valuable service in a number of communities. These committees, however, differ from the common advisory committee in that they usually represent specific occupations, whereas the advisory committee, which it must be confessed has not functioned very effectively, has merely been a committee representing in a general way the entire group of occupations with which the program dealt.

ADULT EDUCATION

Progress.—The tendency to make increasing provision for adult education has gone steadily on. The findings of Thorndike and others with regard to the learning power of adults is gradually finding recognition in educational circles, thus doing away with the old idea that it was useless to provide education to adults because they could not learn.

The English Plan.—In this connection it is rather interesting to note that in England practically the whole scheme of vocational education is set up on the basis of dealing with employed persons. Nearly all of the vocational work takes the form of extension courses. It is further interesting to note that in many cases such courses have been worked out by coöperative committees drawn from the occupation itself.

Instruction vs. Training.—Educational psychologists generally recognize that the learning process really consists of two stages: first, that of learning the job or the task; and second, that of securing sufficient repetitive practice so that the carrying on of a standard procedure or of a certain habit of thinking becomes, so to speak, automatic. These two stages may be designated as the "instructional" stage and the "training" stage. A very serious difficulty in most vocational schools has been that they have been practically satisfied with carrying the student through the instructional stage and have made little serious provision for the training stage. This failure has been largely due to the fact that altogether too much content has been introduced into many courses. The theory has been that if the student has been instructed he can secure adequate repetitive practice after he goes to work or in connection with his work. Under these conditions the ex-student is either unemployable or is unable to capitalize on his school experience. Hence, the whole question of how much content should be included in vocational programs working on a specified time allotment is becoming a matter for serious consideration. Little is known about the time factors involved but no doubt these problems will be worked out by competent research workers in the near future.

VOCATIONAL GUIDANCE WITH REFERENCE TO VOCATIONAL EDUCATION

A great deal of confusion still exists in the minds of many individuals between vocational guidance and vocational education. Vocational guidance, so far as it may function, must precede vocational education in the life experiences of the individual. Since in one form it involves an attempt to give participating experience in a number of type occupations as in the case of junior high school programs, it has been difficult for many people to distinguish between work whose purpose is to assist an individual to find himself occupationally, that is, vocational guidance, and work whose purpose is to equip him to practice a chosen vocation or part of a vocation, that is, vocational education. This situation has caused much difficulty in the development of vocational education, since many communities firmly believe that they have set up a satisfactory vocational educational program when all that they have is a vocational guidance program. Believing that they have already made adequate provision for vocational education, they see no reason for making provisions for programs dealing with actual vocational training service to workers or to prospective workers.

TRADE AND INDUSTRIAL EDUCATION

Increase in Courses.—Perhaps the most significant situation in special fields has been the rapidly increasing spread of occupations which are now represented in trade and industrial programs. The number of principal occupations now taught in day schools has nearly doubled in the period between 1924 and 1929. There has been a marked increase in the number of part-time courses dealing with these trades, and a corresponding increase in spread in evening extension courses.

Evening Courses.—In connection with evening courses an interesting reversal of the usual situation has appeared in connection with the business depression. In times past it has usually been found that when business was good workers took advantage of the evening courses and when business was poor the enrollment dropped off. This year the conditions have been reversed. The apparent reason has been that those who were in fear of losing their jobs resorted to further training to secure additional assets so that they would be of more value and hence would be less likely to be dropped.

Continuation Schools.—At the same time, there has been a marked falling off in the attendance on continuation schools. This apparently indicates that employers are doing away with juvenile labor and are endeavoring to hold on to their adult workers, or are giving employment to adults on jobs which during good times are given to juveniles.

Semi-Skilled Training.—More attention is being given to training for semi-skilled jobs, indicating a very healthy situation. The increasing development of coöperative forms of part-time training has been a very distinct feature of the past few years. Such courses have frequently been coupled with the use of coöperative committees. Courses are being made more and more flexible, the whole organization approaching more closely the opportunity type. There has also been a change in the general conception of the function of the trade and industrial course. While it was originally regarded very largely as responsible only for giving skill and technical knowledge, it is now becoming evident that certain additional training objective should be included in the program. Among the more important of these are those dealing with employment adjustment, that is, providing a certain amount of training which will make it easier for the individual to fit into the organization of which he is a part and to equip him to deal more successfully with those situations with which he has to deal as a worker.

AGRICULTURAL EDUCATION

"The Future Farmers of America."—In agricultural vocational education there have been two major developments. At present, agricultural education of less than college grade is given largely through courses in rural high schools. Boys who are taking such courses and who have graduated from such courses have been organized into what is known as "The Future Farmers of America." This is a nation-wide organization and has unquestionably done much not only to stimulate morale, but also to work toward the building up of an organization of trained and intelligent farmers which can exercise in the future a great influence on those conditions which affect the interests of the agricultural population. At the present time the Future Farmers of America—F. F. A.'s—number about 40,000 and the organization is growing rapidly. Similar organizations fostered by the U. S. Department of Agriculture, the "4-H Clubs," also are rendering very valuable service along similar lines.

Evening and Part-Time Courses.—The second important development has been the steadily increasing number of evening classes for adult farmers and of part-time courses for farm boys who have left school, but who are on the farm. In many states at present it is considered to be a part of the regular work of an agricultural teacher to carry on certain evening courses; also to develop part-time courses for farm boys.

COMMERCIAL EDUCATION

College Grade Courses.—One significant movement in this phase of vocational education has been the development of certain courses of college grade. This has been true, for example, in connection with the training of executives and supervisors for hotel work. Here again the occupation has been drawn on for coöperative assistance in establishing such courses and in determining what should be taught.

Junior High School Courses.—A second important development is the establishment of terminal courses in junior high schools. This is one phase of the attempt to make the junior high school function directly in meeting the immediate needs of those students who do not go further in the school system.

Comparison with England.—Commercial education in this country, however, is still very largely in what may be called the general stage. A contrast between the courses given in this country and those given in England is striking in that respect. As an example, among the courses given in the City of London College are textiles, long vegetable fibres, cargo damage, iron and steel, the oilseed trade, rubber, canned goods, timber, and the sugar trade. In each of these cases the course is given by an individual who is occupationally competent in that particular occupation or in that particular specialty, and the course has been worked out with the aid of a coöperating committee.

Limitations.—In commercial education as it is being given in our high schools it is becoming generally evident that the conventional concentration upon typewriting and stenography does not square with the evolution of modern business practice. In fact, it has been stated on good authority that not over 15 per cent of the jobs in modern office practice require either typewriting or stenography. The lag of the school in following developments in the occupation for which the school is supposed to train is very marked.

Retail Selling.—In retail selling there has been developed, however, a considerable amount of work of a very efficient character. Much of it is organized on a part-time basis when carried on as public school programs, and much is now carried on by retail establishments themselves.

HOME ECONOMICS EDUCATION

One of the most noticeable developments has been the general trend toward the development of courses in home management and in home personnel relations. At the present time, while training in operative jobs is not neglected, much of the work in research and in the development of content is concerned with the nonoperative field. Perhaps the most serious criticism which has been directed at the present programs of home economics as conducted by some states is that inadequate provision is made for the girl who has dropped out of school and who has not gone to work, and only to a limited degree, for the girl who has gone to work. That so far as its service through the secondary school is concerned, the program is largely confined to the children of those families which can afford to maintain them while in the high school. This point is receiving serious consideration from leaders in the field of home economics and there is good reason to believe that steps will be taken to improve this situation and thus increase the range of groups for whom training is provided.

ENDOWED AND OTHER SCHOOLS

Schools not under public control consist chiefly either of endowed institutions or of schools which are operated for profit. In its organization and character of service the typical endowed vocational school does not differ in any material way from the corresponding school under public control. By virtue of its independence it is usually in a somewhat better position to carry on experimental work but conservatism on the part of the authorities frequently prevents full advantage being taken of this opportunity. Probably the main private vocational training agency in the country today is the correspondence school. It is estimated that over two million individuals in the United States are taking correspondence courses at the present time, nearly all in the field of vocational education. The chief interest in this phenomenon is that so many citizens and taxpayers needing vocational education have to pay for it out of their own pockets while ample financial provision is made by the public for other forms of education.

VOCATIONAL REHABILITATION

Progress of Service.—The special social service rendered by vocational rehabilitation is that of restoring to earning power individuals who through some handicap have been deprived of earning power or through congenital disability have not been able to secure an earning power. Obviously in the absence of such service, such individuals become wholly or partially dependent and to that extent constitute a drain upon the earning power of society or upon those upon whom they are dependent. The recognition of the importance of an organized and definitely functioning public rehabilitation service resulted in the enactment of federal legislation in 1920 providing for the encouragement of such programs operated by the states. Since the enactment of this legislation all but four of the states have established such programs and these programs have continued to develop during the last year.

Administration.—As experience has been secured, certain general principles have been developed and accepted. Among the more important of these is the fact that the type of administration must of necessity be quite different from that which is now usually in vogue in educational work, in that the program must deal entirely with individuals. While in education the primary purpose of administration is to bring together under good working conditions a group of students and an instructor, in rehabilitation the purpose of administration is to bring together an individual suffering from some specific handicap and a representative of the rehabilitation service in order that the necessary steps of making the individual clinic the prescription in terms of a program of training, placement, and follow-up, may be carried on with that individual.

Coöperation with Other Agencies.—One of the chief problems in rehabilitation work is the question as to how such work can best tie up with other agencies dealing with handicapped persons or able to render assistance to handicapped persons, such as the movement for physical rehabilitation, the public school, the employer, organized labor, compensation commissions and other agencies of a similar character. A second problem has been the bringing of the work into the purview of local communities. As at present organized, practically all programs of vocational rehabilitation are carried on as state activities. It is now evident that in many large cities there should be a local center in charge of an individual charged with the responsibility of operating the program within that city if the program is to expand as it should in order to effectively render the special form of social service for which it is established. Development has now reached a point where there is a very general agreement as to the most efficient procedures which should be followed. This, in itself, is a distinct accomplishment since in the early stages of the development of the program there was considerable diversity of views as to proper procedures.

Securing Publicity.—In education, both general and vocational, what may be called concrete evidences of the operation of the program are constantly before the eyes of citizens in the form of buildings, in the form of a large number of citizens served, and in the form of a wide variety of statistics and other pertinent information. Moreover, practically all education is carried on as a community enterprise, hence commands a community interest. As against this situation, the rehabilitation program is carried on by the state and works only with individuals. In at least one state, through the coöperation of the National Association of Newspaper Managers, the state department has been furnished with data on accidents and a considerable amount of newspaper publicity has been secured not only from the standpoint of safety promotion but from the standpoint of acquainting citizens with the operation of the rehabilitation program.

Organized Training Work.—The program as now operated involves the employment of a considerable number of individuals. Almost all of these individuals had little or no training in the special technique of rehabilitation previous to their taking up the work. It is now beginning to be thought that sufficient experience has been secured to warrant the setting up of organized training work whereby that experience can become the common property of those engaged in rehabilitation work, and at the present time steps are being taken to provide certain organized summer courses in at least one land-grant college.

VOCATIONAL TEACHER TRAINING

Funds.—The National Vocational Education Act provided special federal funds to encourage special provision for training vocational teachers. Vocational teacher training is carried on either directly by state boards for vocational education or by institutions to which the teacher training function has been delegated by the state board, such institutions being frequently land-grant colleges.

Procuring Teachers.—The purpose of teacher training work, regardless of the agency by which it is carried on, is evidently to provide for an adequate supply of competent teachers to constitute the teaching personnel of the various vocational schools and courses in agriculture, home economics, and trade and industrial vocational education. In the case of commercial education, no corresponding situation exists, commercial teachers being either drawn from commercial pursuits and learning how to teach on the job, or coming from the college. This condition being what it is, certain very definite trends have become obvious, of which several are of sufficient importance to warrant brief description.

Training for Employed Teachers.—There has been a steady increase in the attention which has been given to teacher training on a professional improvement basis. To a greater and greater extent training service is being provided for teachers already employed and there is a very general tendency to minimize the value of any great amount of teacher training given previous to employment.

Supervising Institutional Training.—Where teacher training has been delegated to an institution there is a very decidedly increasing opinion that such work must be supervised and approved by the state board for vocational education and that the state supervisor must be made responsible for the character of the teacher training since he is responsible for the character of the work carried on in the state in his particular field. There appears to be at present an increasing tendency to criticize the character of the content in many teacher training programs as given in institutions. It is alleged that much of the content which is taugh does not function in the work of th teacher, that much of it is given b individuals who have had no experience in the sort of teaching for whic their students are being trained an that many institutions have tende to take the position that they wer entirely independent of the stat board. In the trade and industria field this situation has resulted, to considerable extent, in the withdrawing of the delegated teacher trainin function from the institution and th taking over of that function by th state board itself.

Summer School Courses.—In connection with the increased emphasi on professional training, there ha been a steady increase in the establishment of summer school course which are of a very definite and specific character, their content bein usually based upon analysis of actua deficiencies of the teacher already o the job. Such courses are being give more and more by specialists draw from the fields of supervision an administration in vocational education and from industry, and less an less by regular members of colleg faculties.

ADULT EDUCATION

By Mary L. Ely

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TYPES OF ACTIVITIES

Many enterprises and activities that have come recently to be known as forms of adult education were in existence long before the adult education movement, so-called, had been started or contemplated. The roots of adult education in this country extend back as far as the New England town meeting of the seventeenth century. In the nineteenth century, town lyceums, established "for the purpose of self-culture, community instruction and discussion of common public interests," carried on the same tradition. Later developments include chautauquas; continuation schools; open forums; people's institutes; people's colleges; corporatio schools; public night schools; museums; libraries; education departments of national associations; educational programs of departments o the Federal Government; correspondence courses; university extensio courses; lecture courses; discussio groups and study groups in churche and clubs; courses and classes fo industrial workers, for college an university graduates, for parents, an for other special groups, such as th foreign-born and native-born men an women who are illiterate. This lis is far from being exhaustive. Ne mediums are constantly being presse into the service. Among the lates being educational motion pictures and radio broadcasting.

DISTINGUISHING CHARACTERISTICS

Summer Sessions.—Since adult education is addressed chiefly to men and women who are employed, its program is necessarily adjusted to times of leisure, and concentrates in evening classes and summer schools. The former may meet several times a week or as infrequently as once a fortnight. The latter vary in length of session from a few days at labor institutes to eight weeks, the period covered by the Bryn Mawr Summer School for Women Workers in Industry, which held its tenth annual session in July and August, 1930. Only one other workers' school dates back to 1921. In the nine years since that date more than a score of adult education summer sessions have been established. Several adult education colleges were also started during that period. Pocono People's College, Henryville, Pa., and others are modeled on the Danish folk schools. Brookwood Labor College, at Katonah, N. Y., and Vineyard Shore School at West Park-on-Hudson, N. Y., are residential workers' colleges.

Tendencies and Methods.—Adult education activities are alike in certain important respects that differentiate them from compulsory education for children and adolescents. Adult education students are men and women of experience and of more or less well-developed interests and concerns. They continue in schools and classes only so long as the programs offer something that seems to them vital and worth while. Therefore, in the planning of adult education curricula the needs and desires of the students must be consulted to a degree that is seldom considered practicable in the case of younger students. Significant tendencies in education have sprung from this circumstance. Teachers are called upon to meet a demand that cuts across the traditional divisions of knowledge and takes, wherever it can be found, the material that contributes to an understanding of human situations and problems. In order that the experience of adult students may be taken into account in the study of subjects to which their experience is pertinent, the discussion method, which gives students an opportunity for active participation, is widely used. What may be called a technique of discussion is being developed by adult educators.

DEVELOPMENTS IN ADULT EDUCATION

International.—The impetus given to adult education as a world movement by the first conference of the World Association for Adult Education held at Cambridge, England, in 1929 was strikingly evident at an international conference on the Relation of the State to Adult Education held in Sweden in August, 1930. Between fifty and sixty delegates from the principal countries of Europe and from the United States were in attendance. Among the important items of business transacted was the formation of two new international committees dealing, respectively, with the fields of museum education and radio education. Plans are afoot for an international conference on radio education to be held, probably in Vienna, in August, 1931.

National Education Association Commission.—At a meeting of the Department of Adult Education of the National Education Association, held in February, 1930, attention was centered upon the program of a National Commission on the Enrichment of Adult Life, appointed by E. Ruth Pyrtle, president of the Association. The Commission, in the furtherance of its purpose, will promote the coordination of national, state and local public education programs and the cooperative effort of all adult education agencies. As an initial step, a five-year program of fact-finding is planned.

National Advisory Committee.—In May, 1929 a National Advisory Committee on Education was organized by Secretary Wilbur of the Department of the Interior, for the purpose of making a systematic study of the functions of the Federal Government in the field of education and of the proper adjustment of its educational responsibilities to those of states and municipalities. Adult education is one of the phases of the subject that are being studied. A first *Memorandum of Progress* was published by the Committee in June, 1930.

Journal of Adult Education.—The American Association for Adult Education published during 1930 the four issues of the *Journal of Adult Education* that comprises its second volume. The *Journal* is the principal medium through which the Association fulfills its function as a clearing house of information and ideas in the field of adult education.

Rural Adult Education.—For two years the Association has been engaged in an analysis of the educational needs of adults resident in rural districts in the United States. In January, 1930, a pamphlet entitled *A Preliminary Inquiry into Rural Adult Education* was issued by the Association. The publication of a full report upon the completion of the study is contemplated.

Alumni Education.—Colleges and universities in increasing numbers have expressed the belief that they have a definite responsibility for the continuing education of their graduates, and projects of alumni education have grown rapidly both in number and variety. Reading lists, alumni groups formed for discussion and study, educational conferences, an educational emphasis in the contents of alumni journals and special bulletins, addressed to alumni, are among the means that have been used to stimulate and maintain intellectual relations between institutions of higher learning and their graduates. Late in 1929 the American Association for Adult Education published, under the title *Alumni and Adult Education,* a report made by Wilfred B. Shaw in which he set forth the results of a six months' study of Alumni Education projects. Since that time Lafayette College has held the second session of its Alumni College—a week of lectures and discussions immediately following the June commencement—and the University of Michigan and Iowa State University have inaugurated similar enterprises. Other colleges and universities in various parts of the country have also provided special alumni programs ranging in duration from one day to three or four days.

Radio Education.—In September, 1929, Dr. Levering Tyson, formerly head of the Department of Home Study, Columbia University, began work upon a survey of the field of educational broadcasting. The Association for Adult Education sponsored this study and in May, 1930, published Dr. Tyson's report, *Education Tunes In.* One of the results has been the organization of a National Advisory Council on Radio in Education, with headquarters in New York City. The main functions of the Council are: to assemble the resources of education in America in support of worth-while broadcasting, to act as a clearing house of information on radio education, and to suggest and aid research and study projects. Only indirectly does the Council act as a program-making body.

Other Studies.—Three studies that are being made under the auspices of the Association and that, at the present writing, are nearing completion deal with (1) correspondence instruction conducted by universities and colleges, (2) prison education in the United States, (3) the reading interests and needs of typical adult groups. Reports upon these subjects are to be published.

BIBLIOGRAPHY

*Alderman, L. R., "College and University Extension Helps in Adult Education. 1928-1929." *Bulletin, 1930 No. 10* U. S. Government Printing Office.

Fisher, Dorothy Canfield, *Why Stop Learning?,* Harcourt Brace.

International Handbook of Adult Education, World Association for Adult Education, Russell Square, London.

Lindeman, E. C., *The Meaning of Adult Education,* New Republic Press.

Martin, E. D., *The Meaning of a Liberal Education,* Norton.

Peffer, Nathaniel, *New Schools for Older Students,* Macmillan.

*(*The*) *Scope and Practice of Adult Education.* Paper No. 10 of the Adult Education Committee. H. M. Stationery Office, London.

Shaw, Wilfred B., *Alumni and Adult Education.* American Association for Adult Education.

Thorndike, E. L., and others, *Adult Learning,* Macmillan.

*Tyson, Levering, *Education Tunes In,* American Association for Adult Education.

Yeaxlee, B. A., *Lifelong Education.* Cassell, London.

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* Titles published in 1930.

PURE RESEARCH IN EDUCATIONAL INSTITUTIONS

By Elbert Vaughan Wills

Editor-in-Chief, U. S. Navy Department Standard Stock Catalogue

GENERAL PROGRESS

The year was marked by steady progress along lines already laid down in relation to coördination of research activities, encouragement of pure research through fellowships and grants, and recognition of the basic importance of pure research as a function of the graduate school. The last-named aspect received particular emphasis in the address of Dr. Karl Taylor Compton at his inauguration as President of the Massachusetts Institute of Technology, June 6. He pointed out the two-fold function of the institution as "the development of science and its useful application through continual study and research combined with the training of men," and stressed the need for "greater emphasis upon the fundamental sciences both in their own rights and as the basis of the various branches of engineering." In addition, a noteworthy emphasis upon the importance of extending the spirit of research into all college and university teaching appeared during the year in several quarters.

COORDINATION OF RESEARCH ACTIVITIES

University of Chicago began the year in the occupancy of its new Social Science building made possible by a grant from the Laura Spelman Rockefeller Memorial. Facilities were afforded for coöperative research in anthropology, economics, history, philosophy, political science, and sociology, and in the field of the Graduate School of Social Service Administration. In the course of an address before the Southern Conference on Education held at the University of North Carolina, in October, President Robert M. Hutchins presented a plan for university reform characterized as a "University of Utopia." Its significant feature was the organization of the proposed institution by major groups rather than by departments, thus making possible coördinated study and research in such a field, for example, as international affairs, in place of the limitation of the student's activity to a single subject. In November the trustees authorized the proposed reorganization.

University of Pennsylvania.—In October, the Medical School of the University of Pennsylvania celebrated its 165th anniversary. Attention was drawn to certain noteworthy achievements of this institution, the oldest medical school in America, and to other significant projects still in progress. The latter were concerned particularly with the coördination of research between the physical and the biological sciences. In these pure research activities were achieved results fundamental to applications within the sphere of the science of medicine. The projects concerned the physics of the diffusion of water and salts across living cells, variations of temperature of the nasal mucosa, and the effects of long wave length x-rays on cells and cellular growth.

Human Welfare Group at Yale.—President Angell reported at the Commencement in June that $3,865,000 had been received or pledged for the Human Welfare Group. Of this amount, $400,000 came from the General Education Board to complete the fund for the Clinics Building. The Rockefeller Foundation furnished the same amount for research to be determined by the University. This group, an outstanding factor in the development of which was the establishment during the previous year of the Institute of Human Relations, represents an example of the growing movement in favor of transcending departmental lines in university research.

FELLOWSHIPS AND GRANTS IN AID OF RESEARCH

Significance of Aid.—Research contributions of members of instructional staffs of colleges and universities are significant not only for their value as contributions and as bases for practical applications, but as a stimulating influence upon the intellectual atmosphere of the institution where such research is in progress. Fellowships or scholarships for graduate students make possible significant contributions to research, often by workers who would otherwise be unable on account of financial reasons to carry on such investigation. Within recent years, this form of assistance has been extended to include students who have received the doctorate or its equivalent. Besides endowed fellowships of this character at several of the leading universities, a large number are maintained by several foundations, such as the American Council of Learned Societies, the National Research Council, and the Social Science Research Council.

American Association for the Advancement of Science announced that about $3,000 would be available for grants-in-aid in research projects in sums ranging from $50 to $500. Awards were made in December for the following year.

The American Council of Learned Societies announced in March special grants totaling $90,000 from the Rockefeller Foundation to provide for the maintenance of fellowships to encourage research in the humanities on the part of scholars having the degree of Ph.D., or its equivalent in training and experience and of demonstrated aptitude for constructive scholarship. Of this amount, $40,000 was to be made available July 1, 1930, and the remainder a year later. Twelve fellowships were awarded in April. During the year, the Council also made available $20,000 for grants in aid of specific research projects. These subventions were of two kinds, the smaller grants ranging from $300 to $500 and the larger ranging from $750 to $2,000. The latter were reserved for mature scholars able to devote at least six months of uninterrupted work to their investigations.

Brookings Institution in June awarded 17 fellowships for research in the social sciences made possible by a donation from George Eastman.

John Simon Guggenheim Memorial Foundation.—Award of 85 scholarships for research and creative work was made by the Foundation, among the recipients being instructors and professors from 34 colleges and universities.

National Research Council.—Aside from grants for scientific research in universities, and award of post-doctorate fellowships, four Storrow fellowships were awarded to aid students in making successful beginnings in research. Eleven grants-in-aid were announced in October. Of these, ten went to members of faculties of American colleges and universities.

The Social Science Research Council in January announced the receipt of a grant of $50,000 from the Julius Rosenwald Fund to finance a series of 27 fellowships in the social sciences in the south, and in June awarded 24 fellowships for work in agricultural economics and rural sociology. A report made public by the Council in February indicated that its activities during 1929 included grants to 43 American scholars for the completion of research projects, the total value aggregating $50,000, the individual amounts ranging from $100 to $2,000. In March the Council announced award of research fellowships for 1930-31 to 22 members of college and university faculties, together with one special fellowship appointment and the renewal of one fellowship for a second year.

Milton Fund at Harvard University.—Thirty-nine awards, aggregating more than $47,000, were made to members of the Harvard University faculty from the Milton Fund, designed to carry out specific research projects.

Yale University in May awarded 35 fellowships for advanced research, the recipients having already received the degree of Ph.D. or done equivalent scholarly work. Most of these fellowships were connected with the comprehensive program of research being carried on by Yale.

THE RESEARCH SPIRIT IN TEACHING

Educational Reorganization Urged.—President Compton, in his inaugural address, pointed out that "no proper or adequate teaching in these days can be done except as it is permeated with the spirit of research." In a symposium presented at the annual meeting of the Association of American Colleges in January by the General Committee on Research in Colleges, composed of representatives of the Social Science Research Council, National Research Council, American Council on Education, American Council of Learned Societies, American Association for the Advancement of Science, American Association of University Professors, and the Association of American Colleges, Prof. M. M. Metcalf urged that the whole American educational system be reorganized according to an educational program based on the research idea and designed to cultivate the research habit of mind; namely, curiosity, productive effort, individual judgment, and increase of capacity for research through its constant exercise. Such a program, he pointed out, would not only result in the saving of time and more satisfactory results in pre-college work, but on the college level would give the student, through his study of the results of other men's research, an enthusiasm for investigation and a desire to reach out on his own account. Many research problems, he argued, can be fruitfully undertaken by college students, and by this means much may be added to the sum of human knowledge. The justification of such research he found, however, lies in the ultimate results through the training afforded the students.

Requirements For Degree.—At the annual meeting of the Association of American Colleges in January, Dean Gordon J. Laing, of the University of Chicago, argued against the proposal that research requirements for the degree of Doctor of Philosophy be relaxed for candidates intending to teach in colleges. He held that such action would result inevitably in a devitalized curriculum, merely continuing the work of the college level, and degenerating into routine with its necessary accompaniment of attrition of personality.

THE INSTITUTE FOR ADVANCED STUDY

In June, there was announced an initial gift of $5,000,000 by Louis Bamberger, of Newark, N. J., and his sister, Mrs. Felix Fuld, for the establishment of an institution for graduate study and research, to be known as the "Institute for Advanced Study." Dr. Abraham Flexner was chosen as the first director of the institute which was to be divorced entirely from undergraduate and professional instruction and designed to "establish a unique home of advanced learning in which, under competent advice, students and workers may explore any field of research into which their interest or ambition may call them, work in which they may reasonably promise some advancement in the field of human knowledge." The institution will train advanced students for the degree of Doctor of Philosophy, but will provide also facilities for research workers possessing the training represented by this degree. The objectives proposed for the institute are generally similar to those of the Brookings Institution, incorporated in 1927 at Washington, D. C., the latter being limited, however, to training in the fields of economics and government.

RESEARCH DEVELOPMENTS IN INSTITUTIONS

University of Cincinnati outlined a plan for the development of its graduate school to provide facilities and opportunity for training and research for mature scholars in the humanities. It was estimated that the project would require the raising of a fund of $8,000,000, of which about one-fourth would be expended for a suitable building, and the remainder used as an endowment.

Columbia University.—A foundation for research in American legal history was established in the law school of Columbia University. The plan involves the gathering of "a group of trained men to explore the vast, untracked domain of American law." Columbia University added a valuable adjunct to research in acquiring the library of Prof. Edwin R. A. Seligman, consisting of about 50,000 volumes on economics, and constituting probably the most important collection of its kind.

Harvard University.—For the purpose of providing adequate support for a steadily pursued policy of basic research at the Harvard Graduate School of Business Administration, there was organized, with a membership made up of business leaders, a foundation designated as the Two Hundred and Fifty Associations of the Harvard Business School. The members pledged themselves to contribute annual dues of $1,000 each "to stabilize and promote research and the collection of material for the teaching of business."

Johns Hopkins University in March announced the receipt of gifts bringing the total donations for its Institute of Law up to $850,000. The Institute seeks an ultimate total endowment of $4,000,000 for the development of research in the field of law in relation to human institutions and practices and in the light of the rapidly changing conditions of the present. A research centre for international studies at Johns Hopkins, for several years in prospect, became a reality with the announcement made in February by Owen D. Young, chairman of the board of trustees for the establishment of the school, that an income of $50,000 a year for the next three years had been guaranteed, and the further announcement that the details of organization had been perfected. This school, bearing the name of Walter Hines Page, will be primarily an institution for research touching international questions, forming a clearing house for international studies in America, and cooperating with agencies of similar purpose in other countries.

University of Virginia.—The Leander McCormick Observatory announced in January the completion of parallaxes measuring the distances of 1,000 stars. This work represented the most extensive project of measurement of stellar distances undertaken by a single observatory.

Yale.—President Angell announced in February a gift of $4,000,000 from the trustees of the estate of John W. Sterling for the building and maintenance of a Graduate School quadrangle. The plans included not only provision for the accommodation of the administrative staff, for a social centre for students and faculty, and for housing more than 200 students, but for greatly improved facilities for instruction and research in the arts and in social sciences.

EDUCATIONAL MISCELLANIES

By Ned H. Dearborn
Professor, New York University

AMERICAN COUNCIL ON EDUCATION

This organization seems to have shown a marked vitality during the year. In July, 1930, the National Advisory Committee on Education issued a preliminary report on Federal relations to education. This report represented the year's work of the Committee and the most constructive proposals available in reference to this important question. A committee of three on Supplementary Materials of Instruction is preparing materials to be used as supplementary subject matter in the elementary and secondary schools. These materials have special reference to the Social Studies. Ten city school systems are coöperating with the Committee in the experimental use of these materials of instruction. A special Committee on Plans and Policies was organized. A sub-committee is working coöperatively with the Social Science Research Council on the organization and functions of state departments of education in relation to other departments of government. Also under the auspices of the American Council on Education there is a New Central Committee on Personnel Methods.

WHITE HOUSE CONFERENCES

There have been several national conferences called to consider some aspects of education. In addition various commissions have been appointed by the President to study certain phases of our social and economic life. Most important perhaps are the commissions on Social Trends, Law Enforcement, Illiteracy, Radio Education, and Negro Education. The conference on Child Health and Protection has, up to date, received the most attention on the part of educators. The conference was held at Washington, Nov. 19-22. Over 1,100 experts had been gathering information regarding the problems indicated by the name of the conference. The purposes are best stated by quoting Secretary Ray Lyman Wilbur: "The White House Conference on Child Health and Protection is to make a survey of our children, to study the forces influencing them, and to try to chart out the wisest courses possible in our future management of youth. There is a duty that maturity owes to youth which can only be carried out by the fullest use of existing knowledge. We have been fortunate in getting together this group of splendid, trained workers and through their united efforts we anticipate that we will be able to bring the great American public to a full appreciation of the responsibilities we owe to our children. The White House Conference must not only gather information, but it must develop methods for communicating it to those in every part of our country, so that an interested and informed citizenship will unite in the solutions of the many problems of childhood."

TEACHING CONDITIONS IN PUBLIC SCHOOLS

This year has seen an increase in the surplus of teachers. It should be noted that undoubtedly the surplus is purely in terms of numbers. The effect nevertheless has been a stabilization of the teaching personnel, *i. e.*, fewer resignations and a longer tenure. The effect will be the raising of minmimum standards of preparation and should result in the selection of an increasing number of the more competent teachers available. Along with the business depression of the year the National Education Association saw fit to appoint a special committee to raise funds for unemployed teachers. There has been an accumulation of sentiment regarding the importance of teacher education. The seventh *Year Book* of the Department of Superintendence of the National Education Association devoted a section to a discussion of teacher preparation and a section of the ninth *Year Book* of that organization was prepared during the year. Various organizations such as The American Association of Teachers Colleges, The National Council of State Superintendents and Commissioners of Education, The North Central Association of Colleges and Secondary Schools, and The Association of Deans of Education in State Universities and Land Grant Colleges united in crystallizing opinion which led to an appropriation by Congress of $200,000 for a national survey to be conducted by the Department of the Interior through its Office of Education. A great deal of help may be expected from this survey report in the stimulation of interest in teacher education and in the solution of its problems.

RESEARCH FUND

The Department of Superintendence of the National Education Association initiated a movement to establish an endowment for their research work. Educational research during the last 25 years has encouraged leaders to feel confidence in the probability of creating a real science of education. The Department of Superintendence wishes to contribute to the realization of this ideal. During the year the Committee developed plans for creating a permanent fund that would yield an annual income large enough to promote educational research in a national way and decided an endowment of $1,000,000 was necessary.

RADIO EDUCATION

Education by radio has met with an encouraging response from the teaching profession during the year. The American School of the Air organized a schedule of programs for 1930-1931 with 105 half-hour periods devoted to education. Twenty thousand schools will regularly follow the course. The Ohio School of the Air has developed to a point where it is generally conceded to have the most outstanding state program of radio education in the country. The Walter Damrosch program of radio concerts for schools and colleges has received such favorable attention that it is predicted 8,000,000 children and others will listen to the 1930-1931 program. This program centers its educational efforts on music appreciation. During education week, Wednesday, Nov. 12, an important program on Negro Education was broadcast. Cleveland has made remarkable progress during the year in its use of the radio for classroom instruction. Throughout the country many schools have their classrooms equipped with radio. The movement so far seems to place an emphasis on the use of the radio supplying supplementary instruction. There is enough attention to the use of the radio in education to justify the statement that the radio is accepted as an important tool in the development of education programs, local as well as state and national.

AVIATION EDUCATION

There was considerable progress during the year of aviation education as a part of the vocational education programs of the public schools. In this connection perhaps the most notable new development is the use of the airplane in transporting university faculty members to extension centers. The School of Education of New York University undertook this enterprise in September. If the use of the airplane in this manner proves feasible, other colleges and universities and state departments of education will be able to make use of this means of transportation in the development of programs of extension education that will include a great many aspects of adult education besides teacher education.

EDUCATIONAL STANDARDIZATION

Sentiment has been crystallizing for some time regarding the problems of standardization. Many accrediting agencies have given these problems serious thought during the year. A special committee of the North Central Association of Colleges and Secondary Schools has been appointed to undertake an extensive investigation to determine whether new types of standardization may be substituted for some of the older ones. These questions are of interest not only to accrediting agencies of the kind just mentioned but to colleges and universities that are far-reaching with respect to such matters as educational requirements, scholarships, standards and requirements for graduation. Questions are being raised regarding the place and function of national accrediting organizations. Some contend that regional standardization is more desirable than national. Others point out that the ultimate agency in standardization should be the state department of education. The limitations and the benefits of standardization are also being recognized. The year's activity should lead to important studies and conclusions regarding this far-reaching question.

COGNATE SOCIETIES

GENERAL

American Assn. for Adult Education, 41 E. 42nd St., New York City.

American Assn. for the Advancement of Science, Smithsonian Institute Bldg., Washington, D. C.

American Civic Assn., 901 Union Trust Bldg., Washington, D. C.

American Council on Education, 26 Jackson Place, Washington, D. C.

American Council of Learned Societies, 907 15th St., Washington, D. C.

American Education Assn., 522 Fifth Ave., New York City.

American Federation of Teachers, 327 S. La Salle St., Chicago, Ill.

American University Union, Columbia University, New York City.

General Education Board, 61 Broadway, New York City.

National Assn. of Directors of Educational Research, University of Michigan, Ann Arbor, Mich.

National Congress of Parents and Teachers, 1201 16th St., N. W., Washington, D. C.

National Council of Education, 200 New Jersey Ave., N. W., Washington, D. C.

National Education Assn. of the U. S., 1201 16th St., N. W., Washington, D. C.

National Home and School Assn., Inc., 17 E. 42nd St., New York City.

National Research Council, Division of Educational Relations, B and 21st St., N. W., Washington, D. C.

National Society for the Study of Education, 19 Putnam St., Danvers, Mass.

Public Education Assn., 8 W. 40th St., New York City.

INTERNATIONAL

Assn. of American Rhodes Scholars, 2 W. 45th St., New York City.

Institute of International Education, 2 W. 45th St., New York City.

International Council for the Education of Exception Children, 100 E. Grand River Ave., Detroit, Mich.

International Council of Religious Education, 100 E. 42nd St., New York City.

International Educational Assn., 80 E. 11th St., New York City.

International Kindergarten Union, 1201 16th St., N. W., Washington, D. C.

International Lyceum and Chautauqua Assn., 431 S. Wabash Ave., Chicago, Ill.

League of Nations Committee on Intellectual Cooperation, Geneva, Switzerland.

Pan-American Educational Congress, Universidad de Chile, Santiago, Chile.

TEACHERS

American Federation of Teachers, 327 S. La Salle St., Chicago, Ill.

Educators Assn., 303 Fifth Ave., New York City.

Head Masters Assn., 241 W. 77th St., New York City.

National Assn. of Teachers Agencies, 179 Whitehall St., Atlanta, Ga.

National Student Forum, 2929 Broadway, New York City.

Students Cooperative Society, 565 Fifth Ave., New York City.

Teachers Council, 500 Fifth Ave., New York City.

Teachers Union, 70 Fifth Ave., New York City.

SCHOOLS

American School Citizenship League, 405 Marlborough St., Boston, Mass.

Federation for Child Study, 242 W. 76th St., New York City.

National Assn. of High School Supervisors and Inspectors, 1016 Michigan Ave., Ann Arbor, Mich.

National Assn. of Secondary School Principals, Oak Park, Ill.

National Kindergarten Assn., 8 W. 40th St., New York City.

Y. M. C. A. Educational Secretaries Assn., 65 Hanson Place, Brooklyn.

COLLEGES AND UNIVERSITIES

American Assn. of Collegiate Registrars, University of Pittsburgh, Pittsburgh, Pa.

American Assn. of Junior Colleges, Central College, Conway, Ark.

American Assn. of University Professors, Charles River Road, Cambridge, Mass.

American Society for the Extension of University Teaching, 925 Chestnut St., Philadelphia, Pa.

American University Union, 2 W. 45th St., New York City.

Assn. of American Colleges, 111 Fifth Ave., New York City.

Assn. of American Universities, University of California, Berkely, Calif.

Assn. for Colleges for Negro Youth, Shaw University, Charlotte, N. C.

Assn. of Land Grant Colleges, Iowa State College, Ames, Iowa.

Assn. of Urban Universities, College of the City of New York, New York City.

College Entrance Examination Board, 431 W. 117th St., New York City.

National Assn. of Colleges and Universities, Atlanta, Ga.

National University Extension Assn., Dept. of Education, State House, Boston, Mass.

New England Assn. of Colleges and Secondary Schools, Wellesley College, Wellesley, Mass.

Phi Beta Kappa, 145 W. 55th St., New York City.

PROFESSIONAL EDUCATION

American Assn. of Teachers Colleges, School of Education, Cleveland O.

American Bar Assn., Section of Legal Education, 209 S. La Salle St., Chicago, Ill.

American Medical Assn., Council on Medical Education and Hospitals, 535 N. Dearborn St., Chicago, Ill.

Assn. of American Law Schools, 62 Law School, Harvard University, Boston, Mass.

Assn. of American Law Schools, 102 Law Bldg., Iowa City, Iowa.

Assn. of American Medical Colleges, 25 E. Washington St., Chicago, Ill.

SPECIAL EDUCATION

American Assn. to Promote Teaching of Speech to the Deaf, 1601 35th St., N. W., Washington, D. C.

American Child Health Assn., 370 Seventh Ave., New York City.

American Humane Education Society, 1801 Longwood Ave., Boston, Mass.

American Physical Education Assn., Highland Station, Springfield Mass., Box G.

National Assn. for the Deaf, School for the Deaf, Trenton, N. J.

VOCATIONAL

American Assn. for the Advancement of Agricultural Teaching, E. Lansing, Mich.

American Assn. of University Women, 1634 Eye St., N. W., Washington, D. C.

American Home Economics Assn., 41 Eliot Memorial Road, Newtonville, Mass.

Bureau of American Workers' Education, 416 W. 24th St., New York City.

National Society of Vocational Education, Dept. of Public Instruction, Harrisburg, Pa.

National Vocational Guidance Assn., Bureau of Vocational Guidance, Harvard University, Cambridge, Mass.

New England Home Economics Assn., 41 Eliot Memorial Road, Newtonville, Mass.

Trade Union Education League, 26 Union Square, New York City.

Vocational Education Assn. of the Middle West, 1711 Estes Ave., Chicago, Ill.

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